THANKSGIVING

THE PRESIDENT of the United States has sent out his annual message and appointed Thursday, November 24th, as a day of thanksgiving and prayer to God for the abundance of good things that we have had during the past twelve months.

To this great festival day we should come in a spirit of thanksgiving and gratitude for the benefits that we are permitted to enjoy—for life, for health, home, friends, and for all of the other good things that go to make up the material life. We should come to this day in a spirit of good will and happiness and of gratitude. This is a day when we emphasize the good things in life, but if we only fill our stomachs with food and not our minds and hearts with the higher things of life, we have allowed a wonderful opportunity to pass without getting the real benefits.

Let us therefore come to this day with hearts full of gratitude to Almighty God, with a smile on our faces and a kindly word to those whom we meet, and send out to all mankind only good thoughts and well wishes.

EDITORIAL

New Census Schedules for the Paper Industry

A CONFERENCE was held at the Merchants' Association offices in New York on Thursday, October 27, by Director Steuart of the Bureau of the Census, at which the forthcoming biennial census was discussed with representatives of manufacturers' associations. Paul S. Hanway, statistician of the American Paper and Pulp Association, reported to the conference on the effective work the association has been able to accomplish in bringing about a revision of the paper census schedules and the granting of an annual census for the paper industry.

Mr. Hanway's discussion of the subject attracted unusual interest among those attending the conference and brought out the fact that apparently no other industry had made the same effort as has been made by the paper industry to put the census schedule on a satisfactory basis.

In connection with the foregoing it may be noted that the census schedules for paper, woodpulp and converted paper products on which representatives of the paper industry have been working for some time past have been accepted by the Bureau of the Census, and the new schedule will be available for distribution beginning January 1, 1928. They are now in the hands of the Government Printing Office, and as soon as received by the Bureau of the Census, a supply will be placed at the disposition of the American Paper and Pulp Association. The new schedules are in a simplified form not requiring any great amount of time in their preparation, being entirely different from the schedules required for tax and other reports.

Following receipt of the schedules, the association has been asked to co-operate with the Bureau of the Census in working out such descriptions and explanatory matter as may be necessary in order to facilitate their use by the mills so as to obviate the risk of any possible misunderstanding.

The preliminary schedules will be for use only by the Bureau of the Census and by no other division or department of the U. S. Government, nor will they be available to any individual, corporation, state or otherwise. The reports will be collected in strictest confidence by the Bureau of the Census for the one purpose of compiling the totals for manufacture, employment, power, etc., for the industry by grades. No report will be issued by the Bureau of the Census which would in any way disclose the individual operations of any particular mill. For illustration, if there was but one mill manufacturing book paper in a state, the report for that particular state so far as book paper is concerned would not be published separately but would be combined with reports from two, three or more other states, thus completely burying the identity of that particular mill. This explanation is made in detail because of the belief in some quarters that these reports are available to the American Paper and Pulp Association or to individuals or corporations, and this most certainly is not the case.

As pointed out in a recent statement by Doctor Baker, the interest taken by the American Paper and Pulp Association in the classification and grouping of the schedules as contained in these reports is solely for the purpose of benefiting the industry as a whole and not in any way to obtain individual figures, since these are not obtainable under any circumstances from the Bureau of the Census.

The census schedules formerly used did not convey to the paper and pulp industry that information which is most essential in determining research in regard to trends, distribution, new uses, new developments and values of products individually and separately.

Unquestionably, the new report forms will be received with favor by the paper and pulp industry. The main value to be received from the final compilation of the census will of course be in the rapidity with which the Government publishes the combined reports. If the paper and pulp mills will report immediately after having received the new schedules early in the new year, it will be possible for the Department of Commerce to publish the complete statistical details of the paper and wood pulp industry in the U. S. in a period of from four to six months. Heretofore, these reports have been issued from twelve to fifteen months after the forms were sent out. With the proper co-operation from all the mills and from all the associations, and with the Government's present attitude toward the paper industry, these reports should be available next year not later than the middle of the year and possibly very much sooner, all of which, will be to the advantage of the paper industry and contribute to its further stabilization.

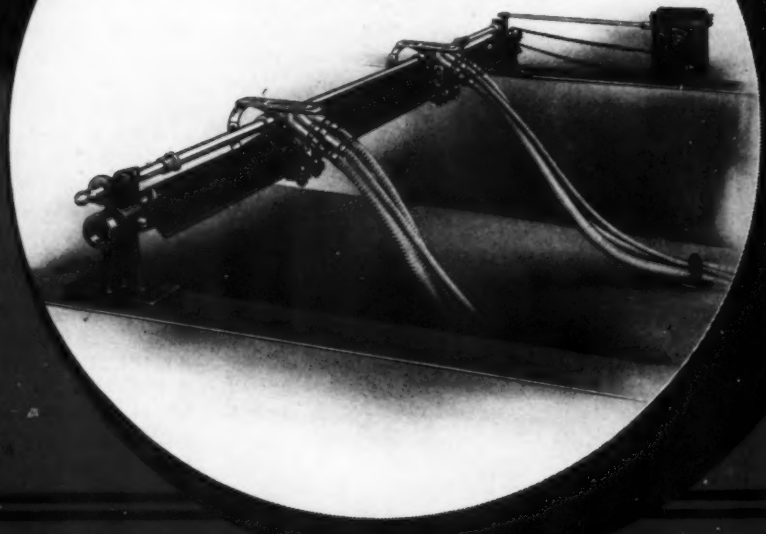
There is now to be a separate census of the woodpulp industry, which was formerly treated as a division of the paper census. In a new woodpulp and pulpwood census, schedules will provide for figures of annual production by grades and subdivision of grades, by values, by amounts consumed at the plant, shipped to other plants controlled, or sold outside, together with value f.o.b. mill in each case, so that it will be possible to figure the actual value of the woodpulp production. Semi-chemical woodpulp, other woodpulp or specified pulps will also be included in the schedule, as will also be all other products and by-products, including turpentine, cymene, sulphite pitch, etc. An enumeration of pulp machinery, to show the number, dimensions and daily capacity will be required in this schedule.

The Vickery Felt Conditioner

Now definitely established as a necessary part of every paper machine in mills where the measure of performance is the ability to produce uniformly good paper continuously.

BIRD MACHINE COMPANY
South Walpole, Massachusetts

BIRD MACHINERY



Of 450 Conditioners sold in this country, 287 represent repeat orders — conclusive evidence of its earning power.

EDITORIAL

A pulpwood census forming part of the wood-pulp schedule is intended to show the consumption of sixteen varieties of domestic wood and of four varieties of imported wood, rating the consumption as for Mechanical, Sulphite, Sulphate, Soda, Semi-chemical and Other Pulps. The average cost per cord, f.o.b. mill for the different varieties, rough, peeled and rossed will also be required in this schedule.

The information to be derived from a comparison of the figures in these schedules is likely to be of great value in determining and checking costs of both raw materials and finished products, and all concerned in the work of developing and obtaining the acceptance of the schedules, in which the American Paper and Pulp Association played a prominent part, are to be congratulated on the result of their efforts.

Associations in the Paper Industry

IN keeping with developments in other industries, the pulp and paper industry has witnessed during the past quarter of a century an extraordinary development of interest in association work, conventions and conferences of groups of special interest being held with great frequency. It is often a question with students of association movements as to whether anything of real importance is ever accomplished by association work, though few people would deny that the ideals and tone of business ethics have been elevated by it.

As was brought out at a recent gathering of the representatives of paper industry periodicals and the office staff of the American Paper and Pulp Association, the paper industry as such is not confined to manufacturers of paper and paper products alone but embraces within its scope the vast group of raw material producers who supply the manufacturer with the quantitative and qualitative elements that enter into the composition of paper and its products. The distributors of paper form an equally important group and this might be extended to include the ultimate consumer, and so establish the fact that the paper industry extends to every home and establishment.

The oldest trade association in existence is the Writing Paper Manufacturers' Association, the first meeting of which was held in 1850, though permanent organization was not effected for another three years. Doubtless many readers of THE PAPER INDUSTRY can look back to a period forty or fifty years ago when the number of associations in active operation was few indeed and their meetings infrequent. Men who have been in business for forty years or more are familiar with the changes which have been brought about in numerous industries besides the paper industry through the operation of trade associations, even if it is partly true, as pointed out by a writer in the *The Saturday Evening Post*, that business and professional conventions are often futile gatherings characterized by a welter of aimless, padded and flowery talk, a considerable proportion of the speechmaking consisting of useless generalities, when not banal irrelevancies. However, it is recognized that the business man does get inspiration and invigoration from attendance at these meetings, which after all do not represent the sum of the work done by associations.

The chaos that would result in nearly all industries were there no associations to publish statistics of production, shipments, inventories, capacities, etc., can be more easily imagined than described. In the paper industry, the extent of inventories carried by an individual company or firm would be determined more or less by the individual management of that company without knowledge of conditions or of the average situation among hundreds of other mills, and errors arising from an individual judgment, or the operation of that astronomical quality known as the personal equation, are too well known to need description. It is seldom that two different observers will see a situation exactly alike.

Because this broader aspect of the industry is recognized by wide-awake manufacturers, various associations have been organized to maintain contacts among its members, promote new avenues of distribution, prevent unethical or undesirable practices, as well as undue discrimination by governmental or public utility agencies and to provide for future sources of materials, all of which help to preserve the stability of an industry.

By co-operating with others in the contribution of statistics of manufacture for tabulation by a central association, individual mills serve the industry as a whole, every paper and pulp manufacturer being benefited by such co-operation, despite the ill-considered criticism of gatherings of business men, manufacturers, chemists or engineers that is so frequently heard from members who may be insensible to the stimulus of group standards of enthusiasm. Many participants do carry away new and stimulating lines of thought and action from association meetings, and it is unnecessary at this day to advertise the value of association work, as this has been demonstrated many times beyond dispute. Were it not for associations, manufacturers would show great reluctance to the exchange or publication of ideas concerning new inventions, processes or improvements, and the encouragement of research would be less liberal than it is. Furthermore, almost every influence that affects direct costs in the manufacture of paper might easily be changed were it not for the work of the trade association.

THE PAPER INDUSTRY

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Steam and Power Developments in the Paper Industry

Influence of Modern Equipment in Reducing Operation Costs in Pulp and Paper Mills

BY GEORGE D. BEARCE

Engineer, The News Print Service Bureau, New York

DURING a comparatively recent period, developments in the field of combustion and power related to pulp and paper manufacture have followed each other with extraordinary rapidity. In general, the modern paper mill has followed closely the central station practice and many new mills have installed modern steam plants and power equipment, with the result that they are able to operate at higher efficiencies and reduce the cost of steam and power for pulp and paper processes.

Large Turbo-Generator Units

The modern central station produces power as a business, and it is naturally possible for them to install larger equipment to advantage. Several stations have boilers rated at 1800 to 2000 h. p. which can operate three to four hundred per cent of rating. The turbo-generator units are much larger in central stations than is ordinarily feasible in the pulp and paper industry. Several central stations employ units with a capacity of 60,000 kw., and it is reported that a unit having a final capacity of 208,000 kilowatts will shortly be installed in a new central station in the Middle West. A number of stations are operating on one pound of high grade coal per kilowatt hour, and slightly better results are expected from some of the latest developments.

An Outstanding Development

One of the outstanding developments in the boiler room has been the introduction of the "steam generator." One type, the "Wood" boiler consists of a furnace with the evaporating surface on all six sides. The sides and the ends are built up with fin tube heating surfaces whereas the bottom is equipped with a bank of bare tubes. The burners for feeding the pulverized coal are located near the upper part of the furnace in the corners and are set at a slight angle so that the flame and gases are given a whirling motion. The heat is absorbed in the sides and ends of the boiler tubes by radiation and the high temperature gases pass down through the bank of tubes at the bottom of the furnace.

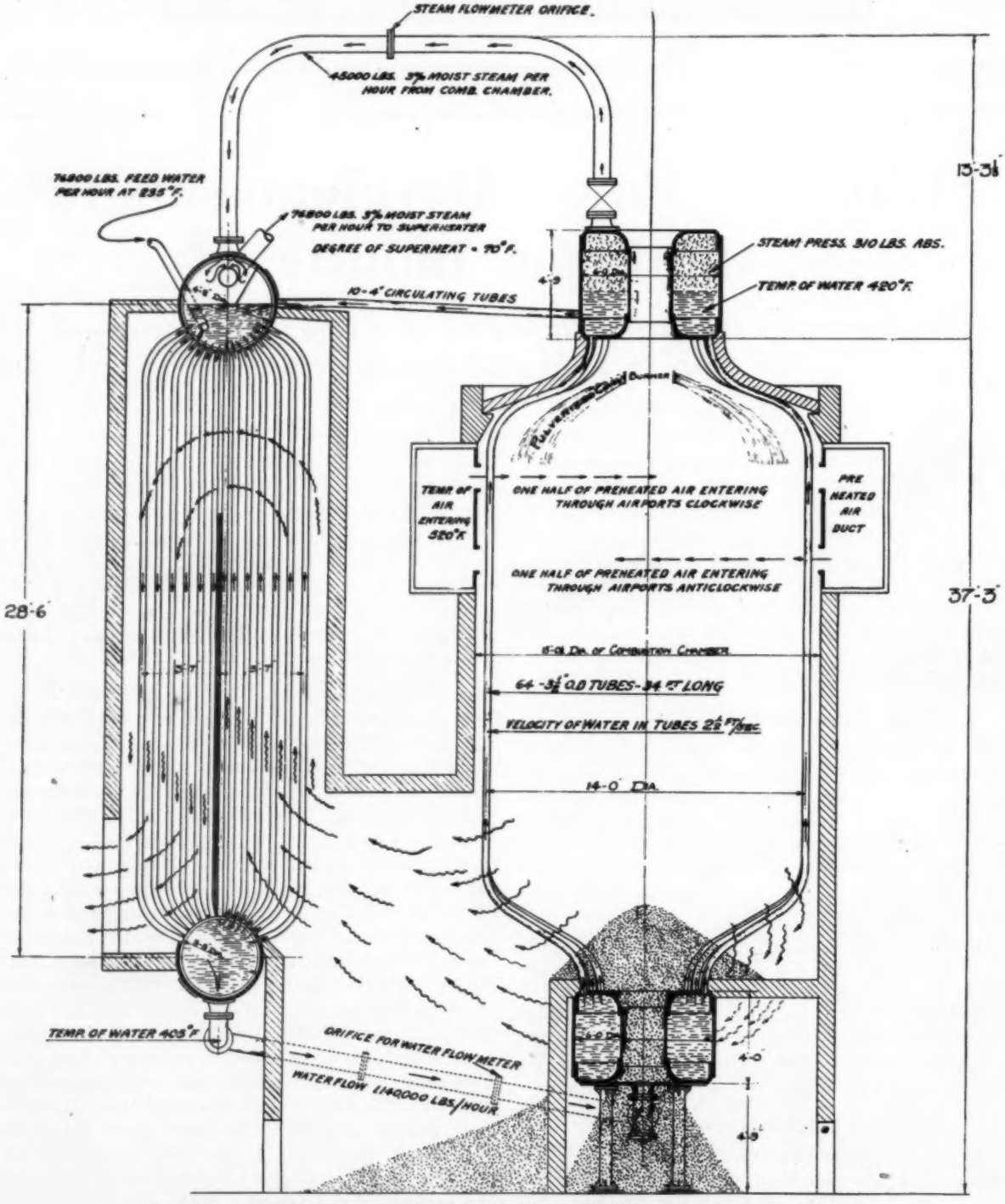
The Burroughs Steam Generator

Another similar boiler which is also especially designed for pulverized coal is the Burroughs steam generator, Fig. 1. This consists of a vertical bent tube type of boiler, the tubes of which are arranged in a circular form. The pulveried coal is introduced through an opening in the top header and is mixed with preheated air in this primary combustion chamber. The products of combustion then pass through the tubes under an arch and go into the second section or economizer part. The nozzles near the top of the primary combustion chamber are so placed that the preheated air enters through the air ports in a counter-clockwise direction and a very complete mixture of air and pulverized fuel is made at that point. The circulation of water in the tubes of the primary combustion chamber is very rapid and the speed of steam generation very much faster than the ordinary boiler. Although this boiler is protected by brick work, practically all the heat is absorbed by the tubes and the existing temperatures do not affect the setting to any extent. Both of the boilers referred to above are especially designed for the use of pulverized fuel and are not adapted to stokers.

Fin Tube Water Walls

In their new East River plant, the New York Edison Company has adopted the fin tube water walls for boilers and in effect get similar results to the two types of boilers just mentioned. The fin tube water walls have a distinct advantage in virtually eliminating the brick work of the settings, thus contributing to a marked decrease in the maintenance cost of the boiler, together with a substantial reduction in radiation losses.

A cast-iron block with a refractory face has been


STEAM FLOWMETER ORIFICE.
45000 LBS. 3% MOIST STEAM PER HOUR FROM COMB. CHAMBER.
74800 LBS. FEED WATER PER HOUR AT 235°F.
74800 LBS. 3% MOIST STEAM PER HOUR TO SUPERHEATER
DEGREE OF SUPERHEAT = 70°F.
10-4" CIRCULATING TUBES
STEAM PRESS. 310 LBS. ABS.
TEMP. OF WATER 420°F.
15-3½
28-6
37-3
TEMP. OF AIR ENTERING 520°K
ONE HALF OF PREHEATED AIR ENTERING THROUGH AIRPORTS CLOCKWISE
PRE HEATED AIR DUCT
ONE HALF OF PREHEATED AIR ENTERING THROUGH AIRPORTS ANTICLOCKWISE
15-0 Dia. of Combustion Chamber
64 - 3½" O.D TUBES - 34 FT LONG
VELOCITY OF WATER IN TUBES 2½ FT/SEC.
14-0 DIA.
TEMP. OF WATER 405°F
ORIFICE FOR WATER FLOW METER
WATER FLOW 1140000 LBS/HOUR
4-0
4-9

GENERAL ARRANGMENT OF BURROUGHS STEAM GENERATOR AS INSTALLED AT THE CANADA SUGAR REFINING CO. LTD MONTREAL P.Q.

Figure 1

developed as a cooling element on water tube side walls and is being used quite extensively. Another form of water-cooled side walls is the regular tube between which are placed refractory brick that allows about half the tube to be exposed to the flame. All of these arrangements have assisted in increasing the ratings of the existing boilers. The radiant superheater is also being used in the side walls, partly as a cooling medium and also as a superheater.

Air-Cooled Side Walls

Many boiler houses, especially those in the paper industry, have adopted the air-cooled side wall, and the latest development is to have the side wall constructed in sections so that a part of it may be removed or reconditioned without affecting the remainder of the boiler wall. In paper mill work, a large amount of condensate is available, and the temperatures are reasonably high. The combination of the water-cooled wall and the air preheater works out in a very satisfactory manner. This is applicable both to pulverized fuel and underfeed stokers. Another practicable combination consists of air-cooled side walls and the regular water economizer and this gives equally satisfactory results. Both of these combinations create a balance and increase the temperature of the water and at the same time provide preheated air for the furnace.

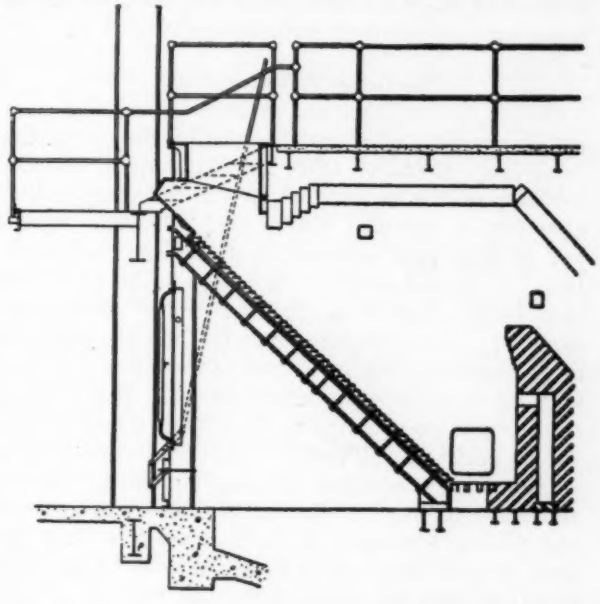
Improvements in Stokers

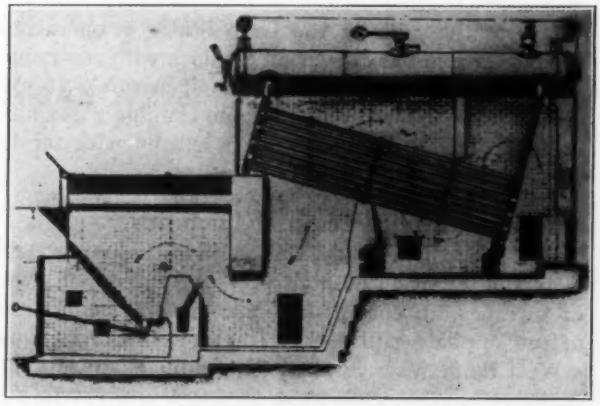
Considerable progress has been made in the improvement of underfeed stokers, and a number of new paper mills have adopted this method of combustion, especially in Canada, where severe winters are encountered. The underfeed stoker has been lengthened and the design so altered that fairly complete combustion is possible, while allowing for flexibility in operation to meet peak loads. Provision has been made for the introduction of preheated air in zones under the stoker, which makes for better combustion conditions. In well designed and properly operated plants, there is apparently no difficulty in using reasonably high temperatures through an underfeed stoker, the high temperatures of preheated air having been utilized successfully in them.

A majority of the large new central stations that have adopted pulverized fuel employ the "central" preparation pulverizing installations, though some prefer the unit pulverizer which appears to work satisfactorily with smaller boilers ranging between 500 to 1000 h. p. hour. It is expected that the unit pulverizer shall be as dependable as a stoker and difficulties caused by breakdowns should not be encountered.

Types of Pulverizers

It is now well recognized that excessive moisture in coal tends to increase power combustion in an appreciable degree and reduces the capacity of a pulverizer, whether it is installed as a unit in front of each furnace or as a central plant supplying the pulverized coal to the entire boiler house. In general, the impact type of pulverizer has been favored because of its flexibility, although some recent installations of the air-swept ball mill in paper mills have





Figs. 2a and 2b—Step-grate furnace

worked out in a very satisfactory manner, and without question, the maintenance cost on ball mills is likely to be very much lower than that of impact mills. However, in any comparison of stokers with pulverized fuel there is little difference to be observed from a standpoint of efficiency, when the boiler unit alone is considered. One of the chief reasons why higher efficiencies are possible is to be found in the fact that boiler accessories, such as water walls, preheaters, economizers, etc., have been adopted which operate to increase the efficiency of either pulverized fuel or underfeed stoker installations.

In connection with the use of pulverized fuel, considerable work has been done in regard to the precipitation of the ash both by mechanical and elec-

trical means. This may be in the future somewhat of a problem in the case of plants located in large cities, though the ash is so finely divided and of such a nature that it will not present a serious problem in the ordinary mill town.

Automatic combustion control has been widely adopted by modern plants, and a well designed installation gives exceedingly satisfactory results.

Burning Wood Refuse

On the Pacific Coast the problem of burning wood refuse has been adequately solved by the use of the "step-grate furnace" (Fig. 2a, 2b). One of the advantages of this furnace is that a primary conbustion chamber is provided where the gases are mixed, and as they pass underneath the bridge wall, additional preheated air is introduced, complete combustion being effected in the secondary cumbustion chamber. This distribution of the hog and over the grate enables a continuous feed to the furnace so that uniform conditions can be maintained. Much of this refuse contains moisture to the extent of 50 per cent, but no particular difficulty is experienced in driving off this excess moisture. Similar equipment may be applicable to some eastern mills where considerable hog fuel is available. It is also possible that the bark when pressed out to approximately 55 per cent moisture may be mixed with the hog on a step grate furnace and burned in a satisfactory manner.

One of the mills in the Lake States is operating the Nordstrom bark dryer on hemlock with resonable success. This equipment makes it possible to extract a large amount of heat from the flue gases and to condition the bark so that it will burn better in the furnace.

High-Pressure Turbines

In the paper industry, the trend in the power field is in the direction of high pressure extraction type of turbines, an enteresting case in point being that of the sulphate mill of The Chesapeake Corporation a West Point, Va. Several other mills have installed turbines that operate at a pressure approximating 400 lb. and 100° to 200° superheat. The process steam is extracted at about 125 lb. for sulphite and 25 lb. for paper mill process work. The operation of the turbine is entirely automatic so that the power developed depends to a considerable extent on the consumption of steam required, though it is equipped with a condenser in order to create a balance of both steam and power. A similar installation was made at the Canada Sugar Refinery in Montreal some time ago. The load in a sugar refinery is even more fluctuating than in a paper mill that is connected with a sulphite plant, because the sugar pans require a little more steam than a digester when starting up and when the pan is finished the steam is completely shut off. In order to take care of this condition, the Canadian sugar company has installed steam accumulators behind the turbine to take care of peak loads.

In paper mill work, the paper machines represent a large portion of the steam demands, and here no serious difficulty is encountered, the extraction turbine taking care of all fluctuating steam demands in both the sulphite and paper mill through the automatic governing device.

Feedwater Treatment

Considerable study has been made in the combustion field in regard to the question of feedwater treatment, and volumes might be written on this subject. The problem is an individual one with every plant, since the condition of the raw water of no two plants is alike, nor is the proportion of raw water makeup the same in any two mills. Many paper mills have installed softening and purifying equipment that have enabled them to run for a period of nearly twelve months without turbining their boilers. Several plants have found it necessary to install a continuous blowdown or feedwater bleeding system. This, under the right conditions, apparantly functions in a satisfactory manner.

In addition to the major developments in the steam and power field, many minor ones are going on all the time, and the result has been that there is a gradual lowering of the cost of making steam and power in the pulp and paper industry as well as in the central station field.

Practice What You Preach

NOT long ago I went into the engine room of a large manufacturing plant where efficiency apparatus is made. The product of this company is known to be the very best, and it was through their product and their preachments for efficiency that the company became famous.

It is well, however, that engineers generally do not know about conditions as they exist in that engine room. My ears met the most deafening uproar I had ever experienced in any engine room. The engines clanked, knocked, scraped and groaned. The belts were slipping and screeching. Steam was sizzling from almost every pipe joint. Assistants to the chief engineer and oilers ran hither and thither in their efforts to keep things going. Oil cans, belt dressings and wrenches were in evidence everywhere. Every man was earning his wages in manual labor.

It wasn't necessary for me to call the chief's attention to the inefficiency of his plant. He had known all about it for years, as long as he had been there. His superiors were to blame. They preached efficiency, but they wouldn't practice it. The company refused to buy new parts until old ones were on the verge of collapse. I cannot understand how the chief manages to "stick it out." He is clever, both as a chief engineer and manager. He has to be in order to keep his job under the conditions.—Schaphorst.

Lessons in Paper Making

Lesson XVI—Building the Reel (Part 2)

By HARRY WILLIAMSON
Class Instructor, Champion Fibre Co., Canton, N. C.

This article is the sixteenth of a series of lessons in practical paper making, appearing each month in The Paper Industry by arrangement with the Champion Fibre Company, Canton, N. C. These lessons are a part of the general education course conducted by this company under the direction of Mr. J. Norman Spawn, educational director.

IN OUR last lesson we used the terms "mechanical crown" and "small local areas of crown." The first term defines the difference in the diameter between the center of the crowned calender roll and each end, previously determined by the qualities and basis weights of paper to be made, and **ground in the roll** to meet these requirements. The second term defines the **expansion** and **contraction** of the calender rolls, the difference in diameter, over small local areas controllable and constantly changeable by the use of **heat** and **cold air.**

On a machine which produces a wide range of papers, heavy to light basis weights, different finishes and calipers, it is highly important that the operators thoroughly understand **the effect of crown** and the manner of working the cold air in conjunction with the leverage weight applied to get the best results. Such a machine would be equipped with two calender stacks, one of seven rolls, and the other of nine or eleven rolls. Each stack would have its top and bottom rolls ground with a crown governed by the two following factors:

(1) The total weight of the stack itself, and

(2) The total leverage weight to be applied on the heaviest basis weight sheet of highest finish.

With these two factors **fully** in operation, the bottom and top rolls of each stack would form a true straight line contact with the roll next to them. Granted an even caliper and formation of the sheet delivered to the calender stack, even pressure would then be applied across the width of the sheet. On such a machine, however, these two factors are not **always** fully in operation.

A sheet requiring an eggshell finish would only use one or possibly two nips in the first stack. A light weight bond sheet would use five nips in the first stack. A light weight book sheet would probably require three nips in each stack. The rolls not in use would only have a proportion of their weight applied, and, of course, the compound levers in many instances would not be used at all.

The point we want to remember is that the calender rolls are ground with a certain amount of crown to take care of a certain applied weight, and the weight **is not always applied.** Yet we **must have** even pressure available across the width of the sheet, **whether the finish required be high or low.**

When the weight is not fully applied, we, therefore, desire to **lose** crown, and if **more** weight than the rolls have been crowned for should be applied, we desire to **gain** crown.

Reading the reel in the first instance, we would find the center inclined to be soft with a high finish, while the ends would be hard with a lower finish.

To **slightly** increase the weight applied to the journals would not be a complete cure, because a straight line contact would still be unobtainable between the crowned roll and the straight roll. We would have to permit the rolls to **expand from** the center **to** the ends by shutting off all the cold air over these areas, thus losing the **effect** of the mechanical crown.

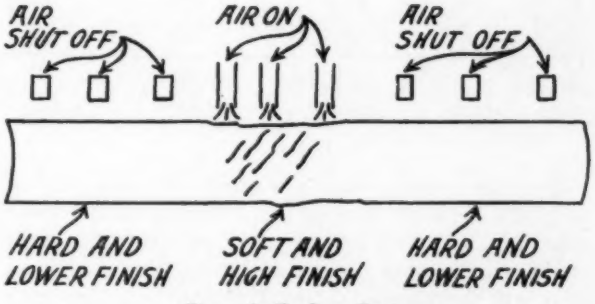


Figure 6—To Lose Crown

It is not enough, however, to simply shut off the air to permit expansion; we must also concentrate cold air **on** the center to permit the rolls to **contract** over this area (Fig. 6). That is the most important factor in reel building by the calender stack. To work simultaneously on both the hard and soft places, get **expansion** and **contraction** over adjacent areas **at the same time.** In other words, get the soft places **harder** and the hard places **softer.**

In the second instance, to **gain** crown, the reel would show **hard** in the center, gradually getting softer towards the ends. The **easiest** method in this instance is to lesson the weight applied to the journals. But we may be making a sheet which has to run true to caliper, and easing the applied weight would probably cause the caliper to run high on the ends of the reel. Again, we may be making a sheet

which is inclined to show a little fuzz on the wire side and the weight is being specially applied to offset this particular trouble. The applied weight and cold air must be worked in conjunction by concentrating the air on the calender rolls **from** the **ends** to the center.

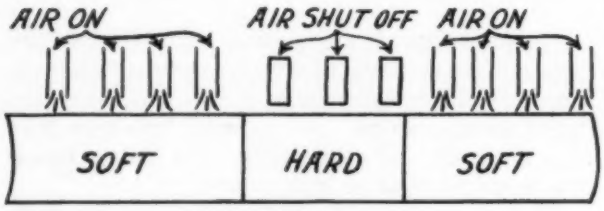


Fig. 7—To Gain Crown

In the instance shown in Figure 7, we have a reel showing hard in the center, slightly soft in the front center, very soft in the back center, and hard on each edge, the kind of a reel we get sometimes at the end of a hard tour when we are feeling tired out. A reel of this kind calls for a nice balancing of values and careful judgment.

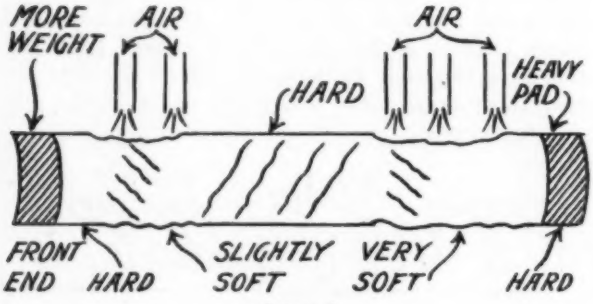


Figure 8

The back center being softest, tilt the applied weight a little by putting more weight on the **front side** (Fig. 8). This will have two effects. The front center will become slightly softer but the hard front edge will also become softer in proportion. The back center and back edge will become harder. Shut the air off the back edge and work a pad behind the calender doctor to expand the roll over this area. Concentrate the air on the soft back center. Shut the air off the center proper and concentrate aid on the soft front center. It may also be necessary to work a lighter pad on the front edge.

By these means we will have created **small local areas of crown**; the rolls have gained **expansion** and, therefore, increased pressure on the edges and center; **contraction** and **less pressure** takes place in the back and front center.

So much for calender manipulation. With a reel like that, however, I would strongly suggest that you pray for help; and more to the point, **wash the darned felts.**

As the calender roll bearings are water-cooled, it is sometimes the practice to reduce the volume of water passing through the water jackets in order that heat may be transmitted to the calender rolls, causing expansion of the ends of the rolls. That is to **lose** crown. This practice is permissable in moderation on the intermediate rolls. It is **never** permissable on the **driver,** the bottom roll.

Moderation is the key note in this practice. The water is there to preserve the bearings. Shutting water off, even if the bearings are not injured will offer greater resistance to drive, and a greater strain will be put on the sheet by driving the calender stacks harder.

Operating Upkeep

The heavy duty calender stacks demand constant care and supervision if they are to be kept in good condition. As we know, the calender rolls are cast and chilled, and it is this chilled surface we must try to preserve.

A very few trips to the grinder will give us calender rolls with little chilled surface left and the principle operating **cause** for these trips to the grinder are **flat places.** Plugging the stack with a wet wad and **failing to stop the stack instantly** is about the quickest method imaginable of spoiling a pair of calender rolls. If the wad does not actually stop the rolls, the surfaces of the plugged rolls are **burned** by skidding on the wad which very soon assumes the hardness of a piece of iron. If the pair of plugged rolls do stop, the rolls **underneath** will keep on running and a revolving roll with the **full weight** of a **stationary roll** in direct contact with it will very quickly grind flat places in both rolls. **Therefore, when a wet wad plugs the rolls, stop the stack.** That is the **emergency** treatment. The **best** method is that of **prevention; never let a wet wad get into the stack.**

Mr. Backtender, train your fourth hand to a regular system of performing his duties when a break occurs. Local conditions must, of course, always govern just what the system shall be. Here is a suggestion. When the signal for a break is given, the fourth hand will:

(1) Locate the position of the break in the width of the sheet **before** the break passes the steam regulator.

(2) Shut off the steam.

(3) Break the sheet down at the spring roll.

(4) **Run** with the "end" to the machine tender who does not want to "guess" the cause of the break; he needs the "evidence."

(5) Back to the dry end, remove the pads, if any, from the doctors; apply the doctors and shut off the cold air.

(6) Back to the steam regulator to put on the steam.

Most of these duties are performed simulantously and come easily within the scope of an active fourth hand, **providing the signal is given in time.** This, of course, presupposes constant watchfulness and alert-

ness on the part of the machine operators; that is a fundamental essential in papermaking. We are in good company, however, for a railway engineer or a ship officer, have to possess the same qualifications, and "Lindy" himself had quite a session on his trip across the Atlantic.

Wet scabs, pitch spots, or any other hard substance sticking to the running calender rolls when the sheet is off the machine, are another prolific cause of small, flat places appearing in the surface of the rolls. Mr. Frank McHenry, one of the best known papermakers of the Eastern Division, for whom the writer had the privilege of backtending some years ago, describes this action as "equal to the blow of a sledge hammer on the roll every revolution."

If it is not desirable to stop the stack until the paper is put on the machine again, clean the sticky substances from the calender rolls with a little kerosene. Should the calender rolls become scarred or dented by the passage of a metal object through them, (nozzles from air hoses have occasionally been caught in this way), the scars can be temporarily treated by tapping them lightly with a hammer and rubbing with carborundum. Such treatment, however, is only a palliative. The safest method is to take the damaged rolls out **as soon as possible.**

To again quote Mr. McHenry, "For as long as there is one flat roll in the stack, it injures the one next to it which in turn injures the next. If I had a calender stack with two or more rolls showing flat spots, I would prefer to take all the bad rolls out and grind them and run the stack short of rolls before I would allow them to run and ruin the whole stack."

Crowding

Sometimes it is hard to prevent the roll next to the bottom roll from "crowding" to one side or the other. Particularly is this true if a very unbalanced weight is applied either by the levers or the use of

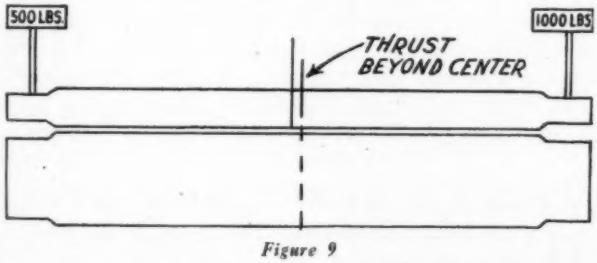


Figure 9

the "dead rolls." If the two rolls formed an absolutely straight line contact, end thrust or crowding would be very slight with the paper **off** the machine and not likely to occur at all with the paper **on** the machine. However, as the bottom roll has a greater diameter in the center, extra heavy weight on one side only will thrust the second roll endways until the center of the second roll is beyond the high center of the bottom roll. (Fig. 9.)

The crowding of the roll against the friction ring will quickly heat up the end of the calender roll, resulting in a **soft end** on the reel and very probably calender cuts and pinched paper. Easing the weight from the heavy side and "jumping the stack" will cause the roll to travel back to its proper position. To "jump the stack," fold a piece of heavy wrapping paper to two or three thicknesses and feed it between the bottom and second rolls **at the end towards which the second roll is thrusting.** With the resistance of the offending weight eased off, it is thus possible to "jump" the second roll so that its center will again ride on the high center of the bottom roll.

Should the crowding consistently occur to the **same** side, even with fairly even weight applied, examination will show a worn bearing or a thin friction ring as the probable cause. The greater the crown in the bottom roll, the greater the possibility of crowding the second roll, and if **both** rolls are crowned, the trouble is still more liable to occur. In this latter case, it is better to install a permanent preventive in the form of an iron strap bolted to the calender frames, and fitting across the end of the second roll journal (Fig. 10). With a ball-bearing ring fitting between the end of the journal and the strap, and proper lubrication, this device is adequate protection against crowding.

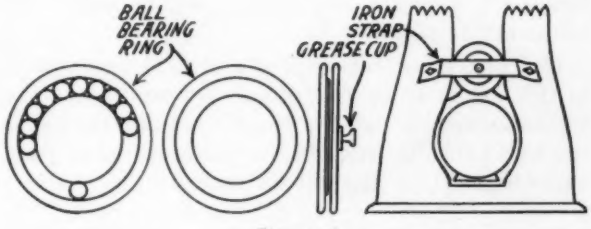


Figure 10

Should end thrust occur, tightening up on the strap bolts will send the roll back to its proper position.

Calender Doctors

Careful attention to calender doctors will save tons of broke. The correct bevel of the blade edge should be carefully preserved and as it becomes worn the whole doctor set up again to a proper fit.

After a new blade has been fitted, it is good practice to smooth file the edge carefully every day for the first few days. This will prevent a "wire edge" forming, which is liable to scratch the surface of the calender roll.

Tightening the bolts of the doctor stands, and checking the springs on the patent doctor arms periodically is good practice. With the heavy jarring the calender stack is constantly receiving, these are liable to work loose. Most calender stacks are equipped with an automatic oil feed with straining device. **Keep the stack clean.** The fine bits of paper and lint gathering around the stack will easily plug the oil feed pipes.

Water and oil will not mix. When spraying the

stack with water to remove the scabs from the rolls, be very careful **not** to permit water to enter the oil strainer pan underneath the bottom calender roll.

Don'ts are never very palatable, yet, strange to say, we usually find that a careful observance of the **don'ts** considerably lightens the burden of our job.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Critical Steam Pressure

IT IS always interesting to think and talk about critical steam pressure.

Years ago this subject was mostly a myth. But, today, so I understand, an experimental boiler in Germany has been operated at the critical pressure.

I will confess that I don't know the exact pressure myself, in pounds per square inch. But I do know that when you can't tell the difference between the water and the steam—**that's** critical pressure.

In other words, as steam pressure increases, more and more water is squeezed into one cubic foot in the form of steam. It is therefore evident that, when the pressure becomes so great that the weight of steam per cubic foot is the same as the weight of water per cubic foot nobody is able to detect the difference between the two. Steam will be water and water will be steam.

If I remember correctly the critical pressure is in the neighborhood of 3,000 lb. per sq. in. and the temperature is about 700 deg. F. At any rate, it is not likely that boilers will ever be operated at pressures higher than the critical pressure.

Belt Drive Going Out?

IT IS claimed by some overly enthusiastic electric motor drive propagandists that belt drive is "going out" in the paper mill industry. They claim that belt drive will soon be extinct.

But I maintain that it is not only staying in the paper industry, but it **should** stay.

Briefly, here are a few of my reasons:

Belt drive is more efficient and the first cost is usually lower than the first cost of directly driven electrical equipment.

On machines that are liable to clog, belt driving is advantageous because the belt will generally slip before anything will break. With electrical transmission there is no weak connecting link and costly breakage often results.

The cost of electrical burn-outs is much higher than the cost of a broken belt or the cost of a belt that has simply slipped off the pulleys.

In most instances it takes longer to start a machine with an electric motor than to start the same machine that is belt driven.

An operator of a machine in a paper mill will not need to be a mechanic in order to keep a belt drive going. But he is almost invariably helpless when something happens to the electrical equipment.

These are not **all** of the arguments favoring belt drive, but I believe they are enough.

Of course I do not claim that these arguments apply to **all** conditions. There are instances where electric drive is preferable and better, but not **always.** Thus if the machine requires 50 h. p. or more, an electric motor is hard to equal. It is well to consider both sides before making a decision.

Maintenance Cost Per Ton

A LARGE central power station in one of the middle states has given out some interesting figures on its maintenance costs.

During the first four months of its record of maintenance costs, 61,004 tons of coal were burned under the boilers.

The total maintenance cost for that period was $11,003.04 which is equivalent to 18.02 cents per ton of coal burned. This cost was divided in the following manner: 2.68c per ton for boiler and superheater maintenance; 1.97c for cleaning the boiler and superheater; 9.32c for furnace and settings maintenance; 1.67c for stoker maintenance; and 2.38c for soot blower maintenance.

These figures will doubtless be of interest to paper mill engineers for comparing with their own costs. It may be true, of course, that in smaller plants the cost per ton of coal will be higher, but perhaps not. A very poor grade of coal was burned in the above central station—39.67% carbon; 35.45% volatile matter; 12.79% moisture; and 12.09% ash. 10,580 B. t. u. per pound.

When Combustion Goes Wrong

HERE are a few factors to think of or investigate when combustion goes wrong.

Are there air leaks at the sides or ends of the grates? Maybe you are admitting too much air. Maybe the combustion space in the furnace is not large enough. Probably the hot gases and air do not mix thoroughly. Probably there is air inleakage through the furnace walls. Your CO_2 sampler may not be working properly, and you are not getting a representative sample of gas. The damper may be improperly set. There may be holes in the fire bed.

Probably the damper is not tight on its shaft and is flopping. It may be that the baffles are cracked and leaking.

Before combustion can be perfect, or nearly perfect, everything must be **right.**

The Professor Was Right

TWENTY years ago a prominent professor of mechanical engineering in a large university was lecturing on steam engines. He explained why wet steam is undesirable in such engines.

Steam turbines had been on the market for several years at that time and it behooved the professor, of course, to pretend that he was a steam turbine expert as well as a steam engine expert.

Knowing very little about turbines I inquired, "Is moisture as harmful in steam turbines as it is in steam engines?"

The professor looked at me in silence for a moment as though in deep thought and then replied with a rebuking tone in his voice:—"A steam turbine, Mr. Schaphorst, is not a water wheel."

Of course I knew that, and his reply was not satisfactory, but for fear that I might be flunked I had to let it go at that. One must not try to "show up" one's professor.

But at last, after these twenty years, I have found something more definite on the subject. I have learned that superheated steam is preferable in steam turbines and that there is a greater gain by use of superheated steam as compared with wet steam than thermodynamic computations and formulae indicate.

This is explained by the greater friction losses of steam containing moisture. The internal friction of a gas such as superheated steam is not so great. The difference is so pronounced that for each per cent of moisture in the steam there is a decrease of one to two per cent in efficiency in the steam turbine.

So much is now known about this subject that a European engineer has developed a scientific formula covering it.

Therefore, after all, my professor was right, but I have always been of the opinion that he wasn't certain. At this time, twenty years later, the best reply I can make is this, "Moisture in steam turbines has a braking effect caused by the greater friction of wet steam."

"Any Pressure"

HAS it ever occurred to you that you can now generate steam at "any" pressure desired? Boilers have improved to that extent.

In addition, steam turbines are available for "any" pressure from the very highest to exhaust pressures.

The steam throughout is **clean** and uncontaminated with oil. After passing through the turbine it may be used without danger for heating water or for any process system where clean steam at the given pressure or temperature is usable.

Also almost any temperature may be given to exhaust steam. Superheated exhaust steam is of greater value than is often supposed for supplanting live steam of higher pressure.

A Handy Circle Chart

WITHOUT any calculating whatever, this chart instantly gives the circumference of any circle. If you know the diameter, column A, the circumference is given directly opposite in column B.

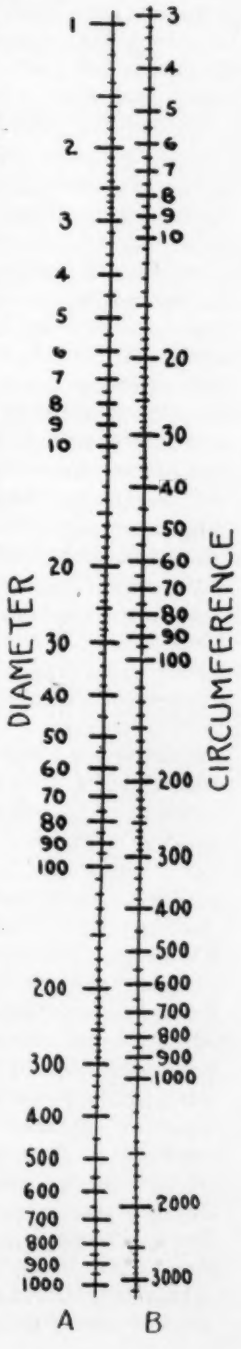
For example, what is the circumference of a circle 30 inches in diameter? Find the 30 in column A and glance across to column B and there's the answer—about 94 inches.

Similarly if you know the circumference and want to find the diameter, simply reverse the process.

An advantage of this chart over tables is that this chart will take care of **any** figure. All that is necesary is to add as many digits to the figures in column B as you do to figures in column A and the answer will always come out right.

A disadvantage is that charts of this kind are not absolutely accurate. Tables are usually more accurate, once you find the correct figures and don't make a mistake tracing through the columns.

Besides, charts of this kind, like the slide rule, are useful for checking longhand computations and tables to make certain that no mistake has been made. As most readers doubtless know, this chart is based on logarithms. It was plotted from a slide rule.



The human element is the greatest factor in accident prevention. Mechanical safety is much easier achieved than the creation of an instinctive habit of safety.

Editorial Comment

By WILLIAM SIBLEY

Self-Abandonment

YOUR life is the most important life ever lived—so far as you are concerned. But it is well to keep in mind there are others on this planet and that they have equal rights to all its pleasures. The chap with the self-satisfied sense of being the only one on earth usually has a lot of trouble.

Recently we were on our accustomed train and as usual there were quite as many swinging to straps as in seats. Among those getting on at a rather late station was a woman of some forty years, carrying a child. Seeing her, the man sitting opposite immediately arose and offered the burdened woman his seat. But before the woman could reach the spot and sit down, one of those slim, highly painted and heavily eye-lidded girls, had slipped into it and was peacefully chewing away at her wad of gum. Enraged, the man who had left the seat in favor of the baby-carrying woman, took the slip of a nincompoop by a hold of her bobbed hair, lifted her out of her seat and sat her, rather forcibly, on the floor of the car. Whereupon the man adjusted his tie, the woman sat down, and the girl got off at the next station.

We couldn't help contrasting this display of selfishness on the part of the girl with the generosity and kindliness of two old folks who live in one of the remote crevices of the Green Mountains, and whose cottage is half-hidden by great, over-hanging trees, the way marked only by a narrow, winding path. At the entrance of this path there is a sign lettered in a style that bespeaks 1844:

"There's a cool drink up here. Stop in and refresh yourself." Following the crude finger of the sign you find yourself ushered into a little clearing beside a tumbledown frame house. In the center of this clearing, and the shade of the spreading apple tree, is a deep well of clear, cold water. At its side hangs a dipper, of ample capacity, so that none need stint themselves of God's greatest gift. Just a bit to the left is a bench on which is seated a basket heapingly filled with ripe red apples. This basket also bears a sign: "Help Yourself." The two old people who occupy this cottage are too poor to give to organized charity, and they take this means of "living by the side of the road and being a friend to man." Indeed, this is a true story and the gentle old couple living there inspired Samuel W. Foss to pen his immortal lines: "The House By the Side of the Road."

How long did you say it had been since you sent a word of encouragement to that bookkeeper of yours who is now in the hospital? Did you ever get time to write that letter to the night-watchman—the one you had thought of congratulating on the completion of his 20th year of service? Have you sent a check to an organized charity since last Christmas—or are you waiting for next Christmas?

Vision cannot be confined to invention. It cannot be confined to any specific line of endeavor. It is necessary to every thing, in every direction. It is the builder that lives in the mind, and which has the courage to look out through the window of thought to find out what is going on, and how the things that now exist may be given new applications for the benefit of ourselves and the world.

Chemistry Aids Commercial Development

FEW other industries have progressed as rapidly or proved of such universal aid as the chemical industry. No longer are we dependent upon foreign countries for many of our basic chemicals—due entirely to developments that have been brought about since 1904. In that period we have increased our production of dye stuffs from 6,000,000 pounds to 92,000,000 pounds;—our pyrolin plastics from $13,000,000 to well over $110,000,000; and products made by electrochemical methods from $29,000,000 to $122,000,000.

Singling out a few actual accomplishments that seem outstanding in importance, we list the following:

1—The development of greater efficiency in gasoline, more mileage per gallon. By the use of the "cracking" process, the proportion of gasoline recovered from a barrel of petroleum has already been greatly increased. We may shortly expect to obtain substantially more mileage from gasoline through the use of tetra-ethyl of lead with more efficient motors.

2—The improvement of rayon yarns, so as to make the fiber stronger. This promises to remove the objection to rayon fabrics that they tend to stretch out and weaken. Thus improved, rayon should become a closer competitor of silk.

3—The manufacture of what have always been considered as organic compounds, rubber, methanol, camphor, acetic acid, from inorganic materials.

Of less immediate, but great ultimate importance, are projects for extracting oil from coal, and making

—— on Timely Subjects

cotton and wool from wood pulp. These processes are claimed to be technically possible, and to have been successfully accomplished. But their commercial profitability is at present doubtful. Oil from coal or shale may prove to be of the utmost importance as natural sources become exhausted. At the present time, however, neither can compete, commercially, with flush production.

These developments must be watched closely. They offer the opportunity for the building up of great and successful new enterprises. Some of them threaten the position of established lines of business. In this rapidly changing world prompt adaptation is the key to continued success.

Before the Horse Is Stolen

HOW the rise of one industry can play havoc with an established industry is shown in figures from the 1925 census of manufacturers, recently made public by the United States Department of Commerce.

According to these figures, the number of phonograph manufacturers decreased 38 per cent, from 1923 to 1925, and the value of their products fell from $107,000,000 to $61,000,000, or 61 per cent, in the same period. The radio industry is believed to be, and doubtless was, the cause of this shrinkage in the phonograph industry.

In commenting on this and similar changes in industry, a nationally known business executive of New England said:

> "For some years I have maintained the policy of investing in no establishment which does not maintain a research department, either as an integral part of its organization or by retaining adequate scientific services, in such a manner as to keep in close contact with new developments which might have a bearing on the company's prosperity."

What does **research** mean? In brief, it means knowing the facts in advance by a systematic plan of fact-finding. Research is not a luxury, it is a necessity—a form of accident insurance. Research supplies the motive power for advance. It is the foe to guess-work and hunches. It substitutes information for opinion, knowledge for gossip.

As the Metropolitan Life Insurance Company puts it: Science instead of surmise is the best guide to policy, whether it concern production, sales, or service to employees, to customer, and to public. Put a foundation of scientific fact-finding before and behind every policy you sponsor and you will help your associates to steer clear of the rocks.

A fact-controlled business is secured against surprise attacks. Locking the stable door before the horse is stolen is prudence. Spotting the horse-thief before he gets into the stable yard is wisdom.

Principles of Business Conduct

THE function of business is to provide for the material needs of mankind, and to increase the wealth of the world and the value of happiness of life. In order to perform its function, it must offer a sufficient opportunity for gain to compensate individuals who assume its risks, but the motives which lead individuals to engage in business are not to be confused with the function of business itself. When business enterprise is successfully carried on with constant endeavor to reduce the costs of production and distribution, to improve the quality of its products, and to give fair treatment to customers, capital, management, and labor, it renders public service of the highest value.

Permanency and continuity of service are basic aims of business, that knowledge gained may be fully utilized, confidence established and efficiency increased.

The Foundation of business is confidence, which springs from integrity, fair dealing, efficient service, and mutual benefit.

The Reward of business for service rendered is a fair profit plus a safe reserve, commensurate with risks involved and foresight exercised.

Equitable Consideration is due in business alike to capital, management, employees and the public.

Knowledge—thorough and specific—and unceasing study of the facts and forces affecting our business are essential to a lasting individual success and to efficient service to the public.

Obligations to ourselves and society prompt us unceasingly to strive toward continuity of operation and betterment of employment conditions.

Representation of products and services should be truthfully made and scrupulously fulfilled.

Waste in whatever form: capital, labor, services, materials, or natural resources, should be intolerable.

Unfair competition which embraces bad faith, deception, fraud, oppression or commercial bribery, is waste.

We pledge our **lawful co-operation** in support of these principles of business conduct.

The Paper Industry 1927 Safety Contest

Accumulative Severity Rates of Mills in Group C, as of September 30, 1927

Participant	Mill	Rate
International Paper Co.	Riley	0
Kimberly-Clark Co.	Neenah	0
Lincoln Pulp & Paper Co., Ltd.	Lincoln	0
U. S. Gypsum Co.	Gypsum	0
Bird & Son, Inc.	Phillipsdale	.02
International Paper Co.	Livermore	.03
Kimberly-Clark Co.	Atlas	.03
The Upson Co.	Board Mill	.03
Kimberly-Clark Co.	Badger-Globe	.10
American Writing Paper Co.	Holyoke	.12
The Gardner & Harvey Co.	No. 1	.12
The Gardner & Harvey Co.	No. 2	.12
International Paper Co.	Winnipiseogee	.12
American Writing Paper Co.	Parsons	.13
Marinette & Menominee Paper Co.	Menominee	.13
The Adams Bag Co.	Chagrin Falls	.14
International Paper Co.	Webster No. 9	.15
U. S. Gypsum Co.	Lancaster	.16
American Writing Paper Co.	Linden	.19
Bergstrom Paper Co.	Neenah	.19
Defiance Paper Co.	No. 3	.20
The Gardner & Harvey Co.	No. 3	.26
American Writing Paper Co.	Norman	.32
American Writing Paper Co.	Monotuck	.35
Sorg-Oglesby-Smith Paper Co.	Oglesby	.38
Union Bag & Paper Corp.	Cheboygan	.41
Sorg-Oglesby-Smith Paper Co.	Sorg	.42
International Paper Co.	Montague	.43
Union Bag & Paper Corp.	Allen	.45
American Writing Paper Co.	Albion	.48
American Writing Paper Co.	Riverside	.50
American Writing Paper Co.	Mt. Tom	.60
Lincoln Pulp & Paper Co. Ltd.	Sulphite	.60
Itasca Paper Co.	Minnesota	.61
American Writing Paper Co.	Gill	.64
Union Bag & Paper Corp.	No. 5	.64
American Writing Paper Co.	Wauregan	.66
Sorg-Oglesby-Smith Paper Co.	Smith	.69
Bemis Bros. Bag Co.	Peoria	.70
Lincoln Pulp & Paper Co., Ltd.	Lybster	.72
Union Bag & Paper Corp.	Fenimore Sulphite	.72
Defiance Paper Co.	No. 1	.73
Union Bag & Paper Corp.	Cheboygan Sulphite	.73
Robertson Paper Co.	Montville	.81
American Writing Paper Co.	Dickinson	.99
Mead Pulp & Paper Co.	Peerless	1.21
U. S. Gypsum Co.	Oakfield	1.86
Thilmany Pulp & Paper Co.	Appleton	1.89
The Northwest Paper Co.	Brainerd	3.75
Union Bag & Paper Corp.	Franklin	4.23
Franklin Board & Paper Co.	Fenimore Paper	6.28

Winner Group A—	Nekoosa-Edwards Paper Co. Port Edwards	.03
Winner Group B—	International Paper Co. Niagara Falls	.29

Mills which failed to report for September

International Paper Co.	Glen Falls, N. Y.
Provincial Paper Mills, Ltd.	Thorold Ont., Can.
Strathmore Paper Co. (3 Mills)	Woronoco, Mass.

Pulp and Paper Mills Use Elliott Service

The industries of this country are daily receiving aid and inspiration through a service which has become generally known throughout industrial circles. This support is given through the Elliott Service, an industrial plan which has been organized for the purpose of increasing the skill of the worker through vocational education, broadening the viewpoint, and strengthening the morale, thus bringing about a greater spirit of co-operation and good-will between employees and management.

This service consists of the Elliott Foremanship Plan, an educational medium which has been compiled by talented and experienced executives; also a pictorial bulletin featuring news items and posters, which are displayed in the plants of subscribers. The worker is kept in close touch with current events, and at the same time his interest is maintained with forceful messages on safety, educational ideas and financial pointers.

A large number of pulp and paper mills have adopted this service, and it has been an important factor in the development of safety in this industry. The generosity and assistance of Elliott Service in the 1927 Safety Contest conducted by THE PAPER INDUSTRY and the National Safety Council is worthy of special mention. The photographs of winners which were published in the October issue of THE PAPER INDUSTRY were taken by them and a copy sent to each member of the Pulp and Paper Section of the Council.

Bureau of Standards Develops Improved Test for Paper

Oxidation products, if present in paper, weaken it, so it is desirable to keep them as low as possible. An improved method for determining the amount of these products has been developed by the Bureau of Standards. In the examination of paper and other cellulose materials, the term "Copper number" is used, meaning the amount of copper reduced from a certain copper solution by a given amount of the cellulose material. This test is used to find the content of oxidation products and other degraded celluloses, the strength and durability of the cellulose material being adversely affected by such constituents.

The test has an important application in judging the quality of high-grade rag-fiber papers in respect to their use for permanent records or for other purposes where great durability is required. It was found difficult in determining the copper number of these papers to obtain satisfactory test results, for owing to their hardness and toughness they offered unusual resistance to the ordinary analytical processes. As a high degree of accuracy is especially desirable in dealing with such papers, endeavor was made to effect improvement in the test method.

The bureau developed a modified method, by which uniform and accurate test results are obtained. The chief modification of the usual procedure is grinding the paper to a finely divided condition. This is considered necessary for obtaining uniform and accurate results. A grinder especially constructed for the purpose is employed.

Technologic Paper No. 354 which has just been issued gives a complete description of this research. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents each.

Prevention of Blindness Discussed at Conference

The most serious causes of blindness—the health and accident hazards of industry—was the subject of a conference in the Hotel Stevens, Chicago, Oct. 12 and 15, 1927, under the auspices of the National Committee for the Prevention of Blindness and the National Safety Council. The conference, called as the result of recent studies by the National Committee, revealing that approximately 15 per cent of all the blind in America have lost their sight in industry, was attended by safety engineers, industrial physicians and surgeons, oculists, industrial executives and public health officials from all parts of the country.

Among those who addressed the conference were Harry Guilbert, director of safety of the Pullman Company, Chicago; Dr. Charles Sheard, of the Mayo Clinic, Rochester, Minn.; Stewart J. Owen, Jr., safety engineer of the National Safety Council; J. L. Benash, consulting engineer of Chicago; and Lewis H. Carris, director of the National Committee for the Prevention of Blindness, 370 7th Ave., New York.

Effective November 1, 1927, Wilson, Paterson, Gifford, Ltd., 101 Murray St., Montreal, Canada, will represent the Naval Stores Division of the Hercules Powder Co., in the Province of Quebec, succeeding Mr. H. J. McAdie in that capacity. Heretofore, Wilson, Paterson, Gifford, Ltd., representing Hercules in the Province of Ontario, but they will now cover both Ontario and Quebec.

Cost Men of Paper Industry Meet

Many Attend Nineteenth Semi-Annual Meeting in Detroit and Hear Good Program

THE nineteenth semi-annual meeting of the Cost Association of the Paper Industry, held in the Statler Hotel, Detroit, Thursday and Friday, October 20 and 21, 1927, was credited unanimously by those attending as the "best the association has ever held." Cost accountants and mill executives from pulp and paper mills, East and West, participated without restraint in the discussions following the numbers on the program, all of which with the exception of one, were contributed by representatives of mill members of the association. The subjects were well chosen and covered by experts on topics from employment supervision, what management expects from the cost accountant, business forecasting and budgetary control to the various technical matters contained in the science of cost accounting.

The meeting was opened in the small banquet room of the Statler at 9:30 o'clock Thursday morning, President J. H. Kline presiding. A cordial note of welcome was sounded by the chairman who asked everyone to rise and announce his name and connection in order that they might become better acquainted. New faces were observed, and hope was expressed for those whose familiar faces were absent, that good fortune had perhaps promoted them to higher positions of trust with their respective companies.

What Employment Supervision Means

The order of the program was proceeded with, and in the absence of J. Norman Spawn, employment supervisor of the Champion Fibre Co., Canton, N. C., his paper entitled "What Employment Supervision Means to the Pulp and Paper Industry" was read by Secretary Burke.

Mr. Spawn's subject dealt with the unknown quantity, the human element. You can always tell what a machine is going to do, but you cannot tell what a man is going to do. Employment supervision is to the pulp and paper mill what blueprints are to the engineer. It is a plan to follow in hiring and dealing with the workers. The plan must be designed to benefit and help the worker as much as the company, the worker and management giving each other a square deal.

Employment supervision relieves a superintendent or foreman of a considerable amount of detail and gives him more time to spend upon getting out production, keeping down costs and attending to the mechanical problems that continually confront him. It has the tendency to prevent making a "family affair" in a department, which is a curse to any mill and should not be tolerated. It also gives the superintendent or foreman more authority by preventing undesirable workers getting into other departments after having been discharged from one department.

The employment supervisor, knowing the different types of men required for different jobs, can in time of emergency very easily get in touch with them by keeping on file the applications of skilled workers and often placing unskilled labor on some preliminary job where opportunity has been given to study the man.

Promoting a good worker to a better job is another one of the employment supervisor's responsibilities. Workers should be given equal opportunities for advancement. Promotion through "pull" is thereby avoided, and merit becomes the basis on which to make advancements. This creates interest in the work, causes the workers to be more contented, and at the same time unconsciously speeds up the quantity and quality of production. It makes them realize the better they know and can do their job, the greater chances they have for advancement. The more a worker knows about his job, the better he will do it, and this lowers the cost of production.

A lengthy discussion on the problems of labor turnover followed the reading of Mr. Spawn's interesting paper, and representatives of sixteen of the forty mills registered at the meeting, replied in the affirmative to the chairman's question, How many of the represented mills have bonus systems. Each gave a brief description of his company's system. The most common form given was length of service as a basis for extra compensation or reward in the form of group life insurance, pension, bonus, or vacation with pay, and some mills paying a bonus for punctuality and regular attendance. Bonuses based on production—such as "density" for the beaterman, profit sharing, and Christmas gifts based on efficiency as viewed by the superintendent and president, with all employees getting something, were other forms, generally speaking, described by the members. Ten of the forty mills represented retire their superannuated employees on pensions.

Elements of Cost in a Cost System

The next speaker on the program was Ralph B. Hersey, cost accountant, Hollingsworth & Vose Co., Boston, Mass., whose given subject was "Our Cost System."

Starting with the observation that labor, overhead and material constitute the three elements of cost in any cost system, Mr. Hersey made an analysis of labor and expense, at the same time describing the forms used. All operations of analysis sheets and the whole cost system of the Hollingsworth & Vose Company, with which he is connected, are controlled by a Works Ledger, which controls the operating accounts of the mill and is an important factor in the operation of the general books. An outline of the entries to the accounts of the works ledger was given.

The first section, dealing with inventory accounts, include productive materials, colors and chemicals, repair parts and supplies, miscellaneous supplies and fuel. These accounts control and balance inventory cards. To the debit side of these accounts are posted the total value of material purchased, together with handling expense of the yard department; all credits received from customers and all disbursements being entered on the credit side. The balance at the end of each month should check with the total of the perpetual inventory cards under that account.

The next account entered in the works ledger is expense, an account which checks out and proves the Analysis of Labor and Expense Sheet. The second and last part of the ledger takes in the operating accounts of the mill, graded as: Class A. Finished Material, Beaters, No. 1 Machine, No. 2 Machine, No. 3 Machine, Class B. Material in Process, Class B. Finished Product, Roll Labor, Roll Expense, Sheet Labor, Sheet Expense, Slitting Labor, Slitting Expense, Handling, Class C. Material in Process, Class C. Finisher Product, Idle Time and Error. The checkup of analysis of stock and half stock is covered in Class A Finished Material.

The value of stock on hand at the end of the month is reached by balancing the debit and credit sides of the account mentioned. On the debit side are charges from raw material used in stocks and half stocks, together with the complete labor and expense of conversion, taken from the analysis of labor and expense sheet. On the credit side are posted the total dollars taken from the summary of cost statements representing the standard cost applied to cut stocks and pulps. The total of all idle time as shown by the analysis of stocks and pulps is entered on the proper side of this account.

The accounts in the ledger dealing with the beater and machine departments take in on the debit side the actual labor and expense in operating these departments from the analysis of labor and expense sheet. On the credit side are posted the total dollars applied as standard cost on the statements. The actual cost of operating the department per hour are obtained by dividing the debit side of the accounts with the total hours of operation as shown by cost statements, plus process hours. "In process" hours are priced at this rate and carried as an inventory balance. The difference between

the debit side and the credit gives the idle time and is applied to the cost statement as an adjustment representing the difference between standard set up and actual.

Mr. Hersey explained that "Class B Material In Process" account covers the product which is in process at the end of the month in the beaters and on the paper machine. In handling "in process" lots, separate records are made which are not included in the finished cost statement for the month. In balancing this "Class B In Process" account, Mr. Hersey found that the balance should equal the total of all materials contained in the in-process lots as shown by Summary of Cost Statements.

Class B Finished Product account covers finished paper in stock from the paper machines. On the debit side of this account is entered the total dollars of all lots of paper through the paper machine, while the credit side contains entries of dollars of paper delivered to "Class C Material In Process" as shown by the Class C summary of cost statements. After the idle time total through Class B is applied to the proper side of this account, the account is balanced, when it should equal the total of dollars applied to the individual lots of paper on the paper stock cards under Class B.

The finishing accounts in the ledger are handled in the same way as beaters and machines. Class C Material In Process represents the balancing of paper brought forward from Class B to C. As all paper is considered either in an unfinished or finished state there is never any balance in this account. Class C Finished Product account is the end of the continuous process, taking care of the disposition of finished product. The total dollars of paper brought forward from Class B to Class C is entered on a debit side of this account, together with any items chargeable to finished paper through the general books, such as return paper going into inventory. The credit side takes care of the "Cost of Sales," which dollars have been charged off against the items of sales in the sales analysis book. The total Class C Idle Time is placed on the correct side of this account and the balance should equal the total dollars applied against the various lots of paper on hand in Class C as shown by the paper card. Idle time account in the ledger is the place where all idle time is posted from the other accounts. The works ledger entries are all made from summary sheets. By having the proper debits and credits on these sheets and having only to fill in the amounts there is little chance for making errors.

In bringing his paper to a close, Mr. Hersey observed that most cost accountants look to their systems for future improvements, being guided in this by past happenings. However, there was no system that could not be improved and he was looking forward to a profitable discussion of the system which he had outlined. He said that his system was one which gave executives and manufacturing heads a real knowledge of facts, and today business decision must be based on actualities and not guess work.

Discussion of Mr. Hersey's paper was requested by both speaker and chairman but the noon hour having arrived, this was deferred until the afternoon session. A group luncheon had been prepared for the members which provided the opportunity for social intercourse.

AFTERNOON SESSION

The Thursday session resumed in the same room at two o'clock in the afternoon, President Kline presiding.

The Cost Accountant's Part in Reducing Manufacturing Costs

The first speaker was L. C. Reynolds, assistant to the president, American Writing Paper Co., Inc., Holyoke, Mass., whose presence was warmly received and his talk attentively listened to for the reason that here was expressed a view of the cost accountant's duties from the manufacturing executive.

Mr. Reynolds, by way of showing latent opportunities for the cost accountant, reviewed the several stages through which industry had passed. The paper industry, and many that are newer, started with one man working as an artisan. Later he hired manual help as demands grew, he working with them. Later he created one as a bookkeeper, who was simply his clerk, but he still knew every detail of his business and knew every employee including their families. Later the business grew so fast that he had to borrow money, and the loaner first looked over his books as well as the bookkeeper. Later the task of running the business became so much larger that the artisan was no more owner but capitalists were back of the artisan. Precedent required an artisan for manager and a bookkeeper to deliver reports, all post mortem. Later amalgamations were and are the order of the day, and simple activities of buying, selling, production and finance have become so complicated that the fundamentals or elements of business control have become obscured; capital is lost and a new division of business management called controller, is being brought forth.

This is the first real step forward for the bookkeeper. But so often the plan has failed and capital still kept losing, they hunted for general managers. A general manager is the head of management, and his most important step is in selection of his executives who with him are the management. Among them is the cost accountant under various designations. While the part he plays depends largely upon the power of his personality to sell his conclusions, nevertheless it is also dependent upon the degree that precedent hinders his associates from a full recognition of the real part he can play.

Being an engineer of training, Mr. Reynolds recalled having listened to many an address as to why an engineer is the logical man for general manager of anything; likewise, the point is often stressed that lawyers are really needed as business heads; often the artisan is at the top of great enterprises, but as to the accountant—one of our largest internationally known manufacturing corporations has had for twenty-five years at the head of its manufacturing works, now numbering 75,000 employees, the former cost accountant of one of the factories out of which the corporation was formed.

Managers must know how to gather together proper assistants but they must then have facts on which to base all action, and of the cost accountant can furnish such facts to the manager, he is the prime mover in his organization. Quoting Owen B. Young, the speaker said, "Facts, are our scarcest raw material. But as raw material, facts need working up, that is interpretation. And in the interpretation, it is very difficult to keep them free from the 'Import tariff of prejudice, self interest and narrowness'."

Mr. Reynolds listed the important activities of the cost accountant in management as (1) reporting past performances; (2) indicating suitable selling prices; (3) controlling current expenditures, and that which is going to grow more important in the future, (4) forecasting the future.

Reporting Past Performances—Comparing the accountant with the man who writes a letter—he must think of how the recipient will read it or interpret it—Mr. Reynolds said past performances can help guide the future. Accounting reports should conform to the physical divisions in manufacturing, such as material, labor, supervision and general expense, maintenance, light, heat and power, shipping, fixed expense, etc. Presenting such reports in terms of previous periods are good for some uses but they would be more helpful to the man on the job if they were compared with an average of past performance. The use of approved bogies based on past performance invariably commands respect of reports when issued by the practical man, for he feels a certain amount of sportsmanship thrill in hitting the mark he himself has approved and helped set.

Indicating Suitable Selling Prices—Belief was expressed that standard costs should be set up for each unit or item of sale on the basis of present market price of raw material, and that such standard costs should include all expected costs based on forecast of operations.

No man expects to always run his mill at exactly 100 per cent capacity, and yet so many costs are based such that both labor and overhead, and administrative and selling are not absorbed unless the theoretical performance of 100 per cent running is attained and maintained. Paper mills throughout the country as a whole have been averaging about 80 per cent capacity for five years. Of course, they never can average 100 per cent, as obviously the customers would have to be quite accomodating in placing their orders. Fixed charges, Mr. Reynolds said, might well be on a 100 per cent basis, but other charges including overhead should be proportioned to

the expected amount of sales forecast for a period, and the system should be so set up that by attaining the forecast, all such controllable cost is absorbed in total. It is important that the basis of a cost system be such that in reaching expected quotas, all expense is absorbed in the cost. In order to do this, the system must be simple enough that it can keep pace with the changing conditions, both as to kind and volume of business, and it must be simple enough to be understood by those outside of the accounting department. Too much detail can sometimes bring about accumulative inaccuracy in the final result.

The question of stop-loss orders was touched upon, showing that such orders only result in stopping the loss of wages of some employees at an expense to the company of wearing out machinery, and even making a loss, for the reason that the real or contributary cost including such items as depreciation are scratched out of the estimate. To prune the expense rather than play with such orders is preferable, and the cost accountant can bring facts and figures that will show the real steps to take as such problems arise; but even though he gets the fever to fill up the mill, he should not paint a too rosy picture of the figures.

Controlling Current Expenditures—Budgetary control was explained in simplest form by quoting the following from Rand's book on business management: "Profits can be assured. The process is so simple that it is at first hard to believe, but I state it in all seriousness. The profits of any business, large or small, can be assured by insisting that cash outgo be less than cash income."

How to adopt a budget that can be adhered to was given as; First, forecasting the income for the period to be budgeted; second, dividing same by amount and percentages between profits, administration, selling and production; third, making a division between executive heads, and fourth, having these executives make up their own budget from all their allotted amount. This puts the authority for control features of the budget where responsibility for execution is lodged.

To have control, minute accounting must be lived up to, and the accountant must be analytical in order to present his data in usable form, must have a simple basis understandable by all who use the data, and must collect and record information currently in such a manner that the results can be reported regularly and quickly after the event.

Such a control will tell us what are the approximate conditions we are living in today as a going enterprise. You know what you are **doing** rather than what you **did**.

Forecasting the Future—In this function lies real control, or as has been said before, super control arises. The cost accountant may not be able to always act in the super control capacity, but he centainly can help the super control regardless of the title or name by which that latter function is performed. While some so-called efficiency engineers might speed up everything, it is not the efficiency or speed with which we do things; it is **what we do** that counts.

A ditch digging company may be able to take contracts and dig the best ditches and dig them most efficiently, but if in the wrong place, are of no avail.

Real control as above described does not concern itself primarily with speeding up. This comes automatically when the control starts functioning.

Good management should always be able to talk in round figures both as to the past and future. Formulas can be worked up which can always serve in making forecasts, of course, always adjusting such results by the abnormals and variables arising at the time. This enables the management to know the trend, and to adjust expenses and to change operating conditions at the time, before it is too late.

Inventory—Of course, generally, the cost accountant is in charge of inventory, which Mr. Reynolds cited as a fifth function or management activity. Inventory is more important than the consideration sometimes given it in setting up an organization. It can easily become larger than the value of real estate, buildings and equipment of the business. The controller must watch the lockup in inventory just as carefully as does the management or directors watch the appropriations for investments.

Aside from the quantity of inventory, there is the question as to whether it is the kind that is of use and does each item have a quick turnover. It is worth noting that each year a given item of inventory is kept, there is being added ten per cent to its original cost on account of interest and housing charges.

Regardless of division of the following activities throughout the organization, they should have an inventory control tying them up as a unit: (1) Raw Material & Supply requisitions on purchasing department; (2) Receiving; (3) Raw material stores; (4) Supply stores; (5) Production orders for sale or stock; (6) Finished stores; (7) Shipping.

Job Audit vs Standard Cost Systems

A brief discussion took place at the conclusion of Mr. Reynolds' splendid address, and then Mr. John T. Robinson, cost accountant, Hollingsworth & Vose Co., took charge of a discussion on the paper which had been presented by Mr. Hersey of that company in the morning. The latter developed into what was more or less of a debate on the subject of Job Audit Cost System vs Standard Cost System. It was said that while the mechanism of the system set up by Mr. Hersey was fine, there were too many details; the standard system provides more simple and adequate forms. Job audit cost systems are nice histories, but control is best found through standard cost systems. Humor and the spirit of levity entered the discussion which finally had to give place to the next subject on the program, entitled "Inaccuracies of Business Forecasting" by H. G. Baldwin of the American Appraisal Company.

Inaccuracies of Business Forecasting

Mr. Baldwin introduced his talk with the appropriate remark that "Business forecasters are like fog horns; they warn of fogs but do nothing to dispel them." The subject of his paper was presented not from a standpoint of criticism or of judging but more from a standpoint of information on such phases of the theory and practice as have come under his observation. It was received with a fine show of appreciation and a brief discussion followed.

Reception and Dinner

The meeting was then adjourned until six o'clock that evening when in the same room, tables had been served for dinner which followed a short informal reception by the officers of the association. Enjoyment of the excellent dinner was augmented through singing in groups and ensemble, and the highly entertaining numbers of two good artists, piano and vocal.

FRIDAY MORNING SESSION

Friday's sessions wereheld in the main banquet room of the hotel, and opened promptly at 9:30 A. M., President Kline presiding.

Two papers were presented followed by the election of officers and the business meeting. "The Determination and Application of Machine Hour Rates in the Paper Industry" by George K. Ferguson, auditor, Watervliet Paper Co., Watervliet, Mich., was the first number and sets of schedules used in setting up machine hour rates were distributed to the members.

"Budgetary Control" by E. F. Bartels, auditor, Munising Paper Co., Munising, Mich., was the next subject, and this also was supplemented with complete sets of schedules used in drawing up a budget.

Business Meeting

Election of a president for the ensuing year was made by ballot, and Ralph Knott, cost accountant, Eastern Manufacturing Co., Bangor, Me., received the majority of the votes cast.

The report of the secretary, Thomas J. Burke, revealed a total present membership of 114 or an increase this year of 14. While gratitude was expressed for the progress which the association had made and for the better condition of its finances, a plea was made for additional funds to permit the association to broaden its scope.

The Trend in Cost Accounting

H. R. Boston, of the Stevens & Thompson Paper Company, presided at the afternoon session and opened the proceedings

with a discussion of "The Development and Future Trend of Cost Accounting." Cost accounting had made its greatest advancement within the past twelve years. The Federal Income Tax Law had done more for the adoption of proper accounting methods than anything else. The movement in the direction of scientific cost accounting while of comparatively recent origin did not mark the actual beginning of cost accounting operations in a paper mlil, as an accountant of his acquaintance had told him that thirty years ago he had what was then called a "cost account" in operation. But judged by present standards the methods then used were inaccurate and furnished only general averages of cost.

The first attempts to tie in the cost accounting system with the general books were likely made by accounting for raw materials and direct labor. With these two items controlled the next step was to control finished stock, which necessitated an attempt at burden distribution in order to determine the cost of goods made and sold. These presented no great difficulties. It was largely a matter of organization and routine procedure. The best method of allocating burden charges to the cost of manufactured products was a question to be resolved. Several theories had to be developed and tried out in order to arrive at the best solution.

Mr. Boston credited the work of Taylor, Gauth and Emerson in the machine tool industry with giving the greatest impetus to the science of cost accounting, for the first treatise on cost acounting dealt with the subject as applied to the machine tool industry. The development of shop management methods created certain conditions which it was necessary to translate into dollars and cents values and scientific cost accounting was a logical outcome of this work.

He touched on the element of cost accounting procedure. While leading cost accounts were in agreement as to what items constituted burden charges there was a considerable difference of opinion concerning the element of interest and analysis and allocation of various types of burden charges. Following an allocation of burden items to productive centers or processes the next important step was to further subdivide or allocate the items so that they could be expressed in terms of a burden cost for the manufactured product. A brief statement and discussion of these methods was then given, after a summary of what he termed the "nursery rhymes of cost accounting," as follows:

1—Burden distribution on basis of materials used, either on a quantity, weight or dollar basis.

2—Burden distribution on a basis of direct labor costs.

Characterizing the second of these "rhymes" as not quite so pernicious in its misleading influence as the first one, he took a few cracks at the vulnerable points. The method presupposed, he said, that a forty-cent an hour workman would receive in six hours the same amount of burden that a sixty-cent an hour man would receive in four hours, an erroneous supposition.

3—Distribution of burden on man-hour basis.

This method was not so objectionable a method as No. 2 because it recognizes that burden as considered at present is mostly a function of time. However the method can only be applied to very special cases as it does not recognize the different pieces of equipment or processes do not incur the same amount of burden per man-hour.

Mr. Boston then discussed the modern method of distribution of burden, that is:

4—Distribution of burden on a machine or process hour basis.

By analyzing to the finest degree all of the burden items chargeable against a production center it is possible with a fair degree of accuracy to further allocate these charges to individual machines or processes within that center. These charges can then be translated into a rate per normal machine or process hour and thus applied against the cost of product manufactures within a specified time.

The accounting precedure for this is supply to debit the work in process or goods manufactured account and credit the production center with so much earned burden. At first this method of accounting brought forth a storm of disapproval because the old fashioned bookkeepers insisted that this left an unaccounted balance in the production center account. They had been use to doing something with every item of expense and this radical step left them bewildered.

Mr. Boston recited some of the objections to the machine hour rate method, saying that difference of opinion existed as to what constituted burden. Normal operating hours was a question to be settled by each industry for itself with reference to the product manufactured and the relation of productive power to consuming power. Productive capacity, financial strength, relation to consuming markets and many other things must be taken into consideration. The question of normal operating hours was one for an economist rather than an accountant.

He touched on the operation of the job order cost system. Cost accountancy was today in a period of transition from the job order cost system to the standard cost system and it gave him pleasure to say converts to the newer method were constantly being made. However, there are some industries in which the standard cost system cannot be used so advantageously as the job order method, and he instanced job printing plants. Generally speaking, however, where certain jobs or operations are repeated at intervals the standard cost plan is the best. The supposition behind any standard cost plan is measurement of actual performance of each production center, from purchasing department to shipping department, against some previously established standard, with the results expressed in money value.

Mr. Boston quoted from a recent issue of the Monthly Labor Review of the United States Department of Labor in which the opinion was expressed that a new industrial revolution was in progress in the United States which might far exceed in economic importance that older industrial revolution ushered in by the series of mechanical inventions which occurred in England in the last quarter of the eighteenth century. He agreed with this and said it would undoubtedly be a more humane revolution than the older one in that it would combine great industrial efficiency with an enormous betterment of the condition of workers and the general status of society. He added that the most recent studies which had been made of the productivity of labor gave reliable statistical support to the conviction that general well-being in our country is increasing with amazing rapidity.

He instanced one of the first statistical warnings that something revolutionary was happening as the realization that production in various lines of American industry was increasing rapidly without a corresponding increase in employment. Thus the volume of manufacturing output from 1921 to 1925 increased about 62 per cent whereas employment increased only about 15 per cent. The paper and pulp industry in ten years had increased its employee output about 34 per cent.

He quoted from statistics compiled by the National Industrial Conference Board in support of his statements concerning increases of production with decreases in cost of management and a reduction in the actual working time of wage earners.

So marked has become the increase in productive capacity, according to Mr. Boston, that the problems of the immediate future will be those of consumption and distribution rather than production.

The tools which management had used to bring about the remarkable results alluded to were listed as, among others, the following:

1—Time study and job analysis.

2—Piece work and bonus wage payment plans.

3—Planning and production control systems.

4—Cost accounting systems.

5—Budgetary control and better financial management through budgets.

6—Mechanizations of processes.

7—Scientific research.

Planning and production of control systems and cost accounting systems were introduced and developed at about the same time, though the development of production control systems proceeded perhaps at a faster rate than cost accounting systems.

Mr. Boston was convinced that the development of systems of budgetary control were to a large extent the result of the

progress made in cost accounting. The very fact that the attempt was made to establish normal burden rates automatically suggested a method of controlling the burden and hence the budget. This idea has of course been extended to control all kinds of expenditures from burden items to direct materials, labor, etc.

It was evident, he said, that work done by industrial engineers and time-study men had progressed at a faster rate in our industrial development than cost accounting. This was a result of mechanical problems having been solved faster than problems of cost finding. He was of the opinion that uniform cost accounting procedure would eventually eliminate unintelligent competition.

The cost accountant is obliged to step very fast in order to keep pace with industrial engineers, time-study men, budget administrators, sales executives and market analysts intent on reaching their individual goal, but everyone is working for maximum efficiency and standardization.

What were the means to be employed and methods to be developed to keep pace with the plans for the future which are being made by the industrial engineer and sales executive? In the larger plants carrying many different shops or divisions and performing many different operations, the best practice is to have a cost system in each shop, run by a cost man who renders periodical reports to the central office where they are compiled. Unless some drastic changes were made in cost accounting methods, not in its basic theory, there would likely be a gradual scrapping and discontinuing of factory cost system as such, not because the factory cost system canprophecy of his which was shared by other industrial engineers and was based on the rapid growth of shop efficiency and the progress which has been made in shop control. He instanced the Ford Motor Company as the most efficient organization in the country. This company has no factory cost system as such, not because the factory cost system cannot be used or that it would not do them good, but because the existing cost system was useless. Obviously the next progressive step would be to design a cost system that would aid even so efficient an organization as the Ford Motor Company.

After a comparison of early and present day cost systems in the course of which he mentioned the aid to purely routine work afforded by mechanical calculating and recording devices, he expressed the opinion that the cost systems of the future would grow more and more complicated in design but more simple in operation. "The cost system constantly has a more complicated story which must be told and the means employed to put it into print must be constantly simplified or else we will be up against the high cost of cost accounting," he said in conclusion.

The major questions considered by Mr. Boston in his paper may be stated as (1) production center idea, which he approved; (2) machine hour rates, likewise approved; (3) more rigid budget control of burden items; (4) more extensive application of piece work and bonus wage payment plans; (5) standards set and maintained for all operations, both human and mechanical; (6) more extensive calculations of idle-time machine and process rates; (7) closer analysis of burden variance and unearned burden; (8) more accurate methods of applying falling and administrative expenses to the cost of the product; (9) cost data presented daily.

Distribution of Manufacturing Expenses

Roy M. Springer, of Bird & Son, Inc., presented a paper on "The Distribution of Expense to Manufacturing or Production Centers," in which he reviewed the practice of accumulating, distributing and controlling expenses of manufacture. Speaking of the methods employed, he said that no one method would adequately cover all situations. For raw material handling a flat rate per ton might be used or a different rate per ton which would compensate for the variation in handling costs for different kinds of material. Many manufacturing processes and hourly machine rate might provide the most satisfactory result. In a finishing department the expense might be applied on a cost per cwt., or a percentage of direct labor. He advocated a division of the mill into different departments. In his own plant a few years ago one department covered all the beaters and jordans but after studies were made the beaters and jordans were separated and later the groups of beaters and jordans were split up into several departments. Changes might be necessary in the departmental line-up to reflect changing conditions or more accurately to distribute expense to the product.

Various systems are used for classifying or symbolizing cost factors. One way was to symbolize all direct material as 1-1 and all direct labor as 2-1. Expenses could be divided into two main divisions, direct or operating expenses and fixed or constant expenses. The figure 3 would be the key figure for direct expenses, 3-3 being used for Repairs to Machinery, while 4 would indicate fixed or constant expenses, Insurance being marked 4-3.

Fifty different expense classifications are used in the plant with which Mr. Springer is connected. For purposes of elucidation he used a hypothetical group and explained each division of charge which had been found pertinent to the manufacture of paper.

In reference to the position occupied by the chemical laboratory of a paper mill plant, Mr. Springer stated one of its important functions to be that of furnishing industry with material checks and tests to insure desired quality. Another function was the development of combinations or formulas which would reduce costs without impairing quality. He mentioned a laboratory development for the substitution of a cheaper material without lowering quality which resulted in a saving of several thousand dollars a year.

Speaking of the profitable use of records, Mr. Springer wondered how many of the mill accountants present interested themselves to study the influence a properly directed cost department might exert in maintaining control and reducing costs. In his own mill monthly detailed reports of expenses by departments and cost by products had been made for several years. Although they were given a certain amount of attention by the superintendents and foremen they were not used as they were intended to be used. A member of the cost department was finally given the job of explaining to superintendents and foremen how the reports were compiled. analyzing any unfavorable conditions and preparing special studies and reports. He was there to make figures talk the language of the mill. At first his efforts met with a lukewarm response, but the men gradually began to appreciate how the figures could be used to assist them in controlling expense and reducing costs. Now when anything looks out of line an explanation is requested.

Cost Variations

R. B. Knott, of the Eastern Manufacturing Company, presented a paper on "The Analysis and Control of Cost Variations," a subject which he said might be termed the "White Elephant" of standard or predetermined costs. His paper was illustrated with charts of paper control accounts which clarified some of the points which were brought out by him. He followed the making and finishing of paper in all their details by accounts shown on the chart, his discourse consisting of a running explanation. In No. 1—material adjustment account—two main variables were caught: First, the difference between the standard cost of materials reported used and the actual average inventory value; second, the important item of substitution of materials from the standard furnish. This report enabled the management to determine when it was necessary to revise the standard furnish and what the revision should consist of, besides affording a check upon the manufacturing department and bringing to light expensive habits of remedying operating conditions of stock. The accounts were presented under six heads. The first or material adjustment account already referred to and others labelled, respectively, Making Process Paper, Finishing Process Paper, Finished Paper, Cost of Sales and Paper Mill Loss and Gain.

The variables in account No. 2 consisted of broke or known waste and shrinkage or invisible wastes. Account 3 is difficult to adjust accurately for each period owing to the flow of paper through the finishing room. An endeavor is made to keep it in continual adjustment by figuring each period an adjusting entry covering the paper finished. This account is charged

with a standard cost of paper delivered from the machines to the finishing room.

Account 4, finished paper, is handled as one item though it embraces five divisions of finished stock.

Cost of sales, account No. 4 could be combined with account 6, paper mill loss or gain.

Taking up the question of inventory variation of raw materials he surmised that all present were more or less bothered by the frequent shortage or overrun of this class of supplies. He used the difference between physical period inventories as a charge into operating expense for consumption, which was a radical change from the old cut and dried method of having issues made out of each bag or the unit of material as it was taken from stock. This was particularly applicable to the treatment of minor supplies such as packing and sealing stores.

The only other variation mentioned was that which occurs in pole drying or loft drying paper. The paper picked up moisture and weighs more leaving the loft than going in. Another process control account called Loft Process Paper was used here.

In bringing his paper to a close he touched on the use of standard costs, saying it was unquestionably desirable to use these as a measuring stick rather than as a target. He called attention in this connection to the question of variation and their intimate relation to the setting of accurate standards for compiling costs, not overlooking their disastrous effect upon profits.

The Outlook

This nineteenth semi-annual meeting came to a close with expressions of gratitude for the excellent program from which everyone had received so much good, and for the progress which had been made by the association. Recommendation was made that consideration be given to having future conference programs arranged with the idea of having them embrace subjects and speakers on the two distinct types of service expected of cost accountants—

1—Service to management in presenting a true and perfect profit and loss balance sheet.

2—Service to management in meeting and overcoming manufacturing problems.

Distribution of Selling and Administration Expenses was proposed as a subject for the next meeting, and the matter was placed in the hands of the program committee. The meeting was then adjourned.

Registration

E. L. Adams, Tarentum Paper Mills, Tarentum, Pa.; W. M. Alton, River Raisin Paper Co., Monroe, Mich.; Vern S. Ames, Kimberly-Clark Co., Neenah, Wis.; A. W. Astley, Chemical Paper Mfg. Co., Holyoke, Mass.

I. C. Barnes, Strathmore Paper Co., Woronoco, Mass.; E. F. Bartels, Munising Paper Co., Munising, Mich.; H. R. Boston, Stevens & Thompson Paper Co., No. Hoosick, N. Y.; Harry C. Bradford, Rex Paper Co., Kalamazoo, Mich.; Stanley Byron, Hammermill Paper Co., Erie, Pa.; Thos. J. Burke, Cost Association Paper Industry, New York, N. Y.

John J. Cahill, Crystal Tissue Co., Middletown, O.; Wm. M. Carney, Scott Paper Co., Chester, Pa., Wm. C. Crowe, The Mead Pulp & Paper Co., Chillicothe, O.; Newton Cuneo, Ontonagon Fibre Co., Ontonagon, Mich.

A. Scott Dowd, The Paper Industry, Chicago, Ill.; C. W. Dunnington, American Coating Mills, Elkhart, Ind.; Vallie W. Dussia, River Raisin Paper Co., Monroe, Mich.

E. H. Ertel, Dill & Collins Co., Philadelphia, Pa.

Geo. K. Ferguson, Watervliet Paper Co., Watervliet, Mich.

P. J. Gates, Detroit Sulphite Pulp & Paper Co., Kalamazoo, Mich., P. H. Gideon, Bryan Paper Co.; Kalamazoo, Mich.; E. E. Grant, Crystal Tissue Co., Middletown, O.

F. J. Hamlin, Rockford Paper Box Board Co., Rockford, Ill.; J. L. Houson, Champion Coated Paper Co., Hamilton, O.; Jos. V. H. Hayes, J. A. Manning Paper Co., Inc., Troy, N. Y.; R. B. Hersey, Hollingsworth & Vose Co., Boston, Mass.

G. T. Ingling, Kalamazoo Paper Co., Kalamazoo, Mich.

C. A. Jasperson, Nekoosa-Edwards Paper Co., Port Edwards, Wis.; R. C. Johnston, Beveridge Paper Co., Indianapolis, Ind.

H. P. Kimball, Strathmore Paper Co., Mittineague, Mass.; Alfred H. King, Crocker McElwain Co., Holyoke, Mass.; J. H. Kline, York Haven Paper Co., York Haven, Pa.; W. H. Kiver, Allied Paper Mills, Kalamazoo, Mich.; R. B. Knott, Eastern Mfg. Co., Bangor, Me.

A. W. Lewis, Michigan Carton Co., Battle Creek, Mich.

Ralph H. Morrill, Chemical Paper Mfg. Co., Holyoke, Mass.; R. W. Murray, Bemis Bro. Bag Co., Peoria, Ill.

C. F. Niederman, Beckett Paper Co., Hamilton, O.

Jas. A. Reilly, American Writing Paper Co., Holyoke, Mass.; John C. Richard, Tarentum Paper Mills Co., Tarentum, Pa.; John T. Rourke, Hollingsworth & Vose Co., Boston, Mass.

F. B. Shemanski, Whiting-Plover Paper Co., Stevens Point, Wis.; Geo. H. Smith, The Adams Bag Co., Chagrin Falls, O.; Roy M. Springer, Bird & Son, Inc., East Walpole, Mass.

R. A. Wells, Bemis Bag Co., Boston, Mass.; K. F. Wenz, Champion Fibre Co., Canton, N. C.; Howard S. Whitney, Bird & Son., Inc., East Walpole, Mass.

American Market for American Paper[1]

By HENRY A. WISE

General Counsel of the Import Committee of the American Paper Industry

THIS is a most appropriate time for the Import Committee of the American Paper Industry to report of its stewardship. As its spokesman, I now shall give you a brief enumeration of what it has done in its efforts to maintain American markets for American Paper. It is my hope that when I shall have concluded these remarks, those of you who have given your support will approve of what has been done and realize the necessity for continued and greater effort, and those of you who have not contributed your support in the past will realize the benefit you have derived from the work and will wholeheartedly join in to carry forward the work and become partners, not only in the benefits, but also in the burdens of the undertaking. The task of maintaining American markets for American paper should be the task of every producer of American paper. With these few words by way of preface, let me proceed with my report.

Cessation of Imports During War

Most of you know of the origin of the Import Committee of the American Paper Industry. Most of you know in a general way of its work. All of you, whether you realize it or not, have benefited by its accomplishments. That you may have the picture in its true light, you must have the proper background. Therefore, I must go back a few years and recall a bit of history. During the period of the great war the importation of foreign paper into the United States almost ceased. At the same time a tremendous expansion occurred in the American industry and the industry was developed and operated to full capacity. During such a time, there was no need for tariff protection as for protection against dumping or unfair methods of competition. The machinery of the Government organized for the purpose of dealing with these subjects was unemployed, and, like other idle machinery, became somewhat obsolete and necessarily more or les inefficient. In a period of four years many changes occur. Looking back over such a period of time, you will probably discover that many qualities of merchandise produced at the beginning of the period have been discontinued, that others heretofore unknown have come into use, and that others have so changed in character or form as to be hardly recognizable. In a like period, you will also probably discover that there has been quite a change in personnel of those producing, handling, and dealing in such commodities. And with such changes you will probably discover a corresponding change in viewpoint concerning such commodities. During the period of the great war many makeshifts were resorted to; many substitutions occurred; many land marks were lost sight of; many things were forgotten, and many things and many people got out of joint. In merchandising, there was no such thing as competition, except perhaps in production, and, this as you all know, resulted in most branches of industry in an overdevelopment of capacity which left many branches of industry in a distressing condition at the close of the war, a condition which threatened a very distressing form of competition, and one which would be fought with even greater danger if to the situation should be added the element of unfair foreign competition. But no thought was given to this while the so-called good times lasted.

Tariff Law Inadequate

Then came the end of the war—we waked up. The day of maximum production was at an end. There was not enough business to go around. The manufacturing plants of Europe that had been idle during the war resumed operations. European laborers who had been with the colors were returning to the farm and the factory. With a greatly depreciated currency, European factories could purchase raw materials and employ labor on a basis that would place their costs far below anything possible in America. European markets were bankrupt and could take but a small part

[1] Address delivered at the luncheon of the Salesmen's Association of the Paper Industry at Chicago, Oct. 25, 1927.

of the output of these European mills, and pay for it only with depreciated currency. Naturally, therefore, the market for their products was in America. This was the prospect with which you were confronted.

It was but a short time before the prospect was a reality. True we had a tariff law divined for the protection of American industry and containing provisions intended to prevent dumping of and unfair methods of competition by foreign merchandise. This tariff dealt with various classifications of paper. Many of its provisions were so technical and complicated as to be bewildering to American manufacturers; some acting conjointly, others on their own accord, had procured the enactment of many of its provisions. Many of these provisions were muddled, ambiguous, and perhaps meaningless, as a result of ignorance in some instances and of ulterior purposes in others. At best, the tariff provisions left many loop holes and afforded many opportunities for designing purpose to flood the country with many classes of foreign paper.

Having secured the enactment of these tariff laws, the American manufacturer apparently labored under the delusion that nothing further was required to be done. It apparently never occurred to the American manufacturers that there was any reason or need for them to co-operate with the customs officials for the proper enforcement of the law. Apparently they felt that because the law was on the statute books it would be enforced. It was a law, and a law is a sacred thing. Therefore, it must be observed. Thus the matter had been left.

This had been the attitude of our American manufacturers for many years prior to the war. There had never been any organized effort to keep watch over importations; no organized effort to co-operate with, or enlighten, or assist Government officials charged with enforcement of the laws; no effort to explain to, and educate such officials to a proper understanding of the thousand and odd technicalities involved in the numerous classifications of paper; no organization to which the officials could look for any such information.

Misclassification

Let us look at the situation as it existed in 1924. The frontier of the United States proper extended a distance of approximately 10,000 miles, along the Atlantic seaboard, Mexican Border, Pacific Coast, and Canadian Border. Along this extensive frontier were numerous ports of entry at which any and all manner of foreign goods could enter the United States. At these various ports, there were Customs officials appointed to examine and appraise all imported merchandise. Some designated collectors, others examiners, and others appraisers, all charged with the duty of enforcing the law. There were literally thousands of such officials and it is safe to say that not 50 per cent of them ever saw a paper mill, and many hadn't the faintest idea of what was meant by most of the provisions in the paper schedules. They were honest, well meaning men, and none of them, except perhaps a very few at ports such as New York, were paper experts. These men had to deal with every known article of commerce, and paper constituted but an insignificant portion of what came under their observation.

There had been no attempt on the part of the Treasury Department to effect uniformity in classification or valuation of merchandise at these numerous ports of entry. Every port was a law unto itself, and its officials construed the tariff provisions as they understood them. And I think I may correctly say that so far as imported papers were concerned, these customs officials received no assistance whatsoever from the American paper industry. Under such a system, and because of the complicated, technical, and overlapping provisions of the paper schedules, there was every reason for the same kind of paper being classified and valued differently at different ports.

Such a situation was bad enough, but on top of this was a condition that made the situation even worse. For more than 20 years there had been little or no information from the domestic producers that was available for these customs officials to assist them in the proper application of the puzzling provisions of the paper schedules of the tariff. No one had ever educated them to the thought that such information might be available. Notwithstanding the fact that the tariff provisions were barred upon domestic commercial designation, and should be interpreted in the light of domestic practices, this fact had been practically lost sight of. On the contrary, instead of consulting the domestic industry in questions of doubtful classification the customs officials had developed the habit of looking to the importers for such information. Needless to say the advice or information so secured hardly operated to the advantage of the domestic industry. I need hardly point out to you the effect of such a course upon the revenues of the Government and the interests of your industry. The customs officials should not be blamed for such a condition. It was really due to the lack of effort on the part of your industry; its inaction, on the one hand, and its unintelligent action on the other hand; I might say, its ignorance in failing to establish intelligent co-operation with the customs officials, and its ignorance in pursuing a course that resulted in antagonizing the very men who should have been its friends, and by such course driving these men to pursue a course resulting in immeasurable damage to the domestic industry.

Customs Officials Lack Co-operation

As before pointed out, the American industry busied itself to procure the enactment of the tariff laws. It saw to it that these laws were thoroughly complicated and technical and then retired to a state of complacency. Then when some American manufacturer felt the pinch of foreign competition, he ran to the Treasury Department, and cried about undervaluation. He did not realize that more can be done through misclassification than by undervaluation. He never dreamed that some poor ignorant customs official might honestly mistake the classification of paper. Usually the complaint on being received by the Treasury Dept. would be placed in the hands of a special agent who would proceed upon the theory that the customs official who passed the merchandise had been in collusion with the importer. The customs official was made to feel that he was suspected and that his accuser was the domestic manufacturer. Through such a method the official was forced to view with distrust complaints from the domestic industry and naturally enough did not turn to that source for information. These conditions were known to the importers and it was but natural that they would take advantage of a situation so favorable to them. The average importer is a man of standing and position in his community. Such being the case, it was but natural that in the absence of evidence to the contrary the average customs official would accept at face value and pass with little or no question any entry presented by such a man. And right here let me interpose and say that it is not my thought, and I do not wish to convey the impression, that importers, as a class, are dishonest. They are not. And as we well know there are many of our most honorable citizens who are engaged in the importation of foreign merchandise, including among their number importers of various grades of paper. As we all know, many honorable importers are frequently in conflict with the Treasury Department over questions involving honest differences of opinion. It is the right of every man to avail himself of the lowest possible taxation by every lawful means. In this we may all deem ourselves fortunate.

Increase of Unfair Competition

From the foregoing, I think I have pictured to you a situation out of which you will realize that there was abundant opportunity for unscrupulous persons to evade the provisions of the tariff law, and to impose all manner of unfair competition upon the American paper industry. Before the organization of the Import Committee, there was much of such competition and it now continues and always will. You, gentlemen, in marketing your product, meet this competition; you are meeting it now. You will meet it hereafter. But it is lessened now and it is our hope that it will be reduced to a minimum. You found it irritating and most difficult to locate, and when located you found it difficult to ascertain through what channels and by what means the competing product had found its way into our commerce. You saw it—you felt it. It was disturbing, and in some cases it was disastrous. It must be combatted and if possible it should be destroyed.

How were you to accomplish this? If the situation was sufficiently concrete and you were financially or politically sufficiently strong, you could pursue one or both of two courses. You could employ a lawyer and fight your competitor, or you could appeal to your congressman—or you could and probably would do both.

Usually the lawyer was ignorant of the technicalities of the customs laws. He was confronted by lawyers who represented the importers and were skilled in the technicalities of that branch of law. And your lawyer accomplished little or nothing. Or if he did accomplish something, the cost to you was probably as great or greater than your savings. Usually the Congressman being generally ignorant on all subjects contented himself with passing your complaint on to the Treasury Department. This in turn followed the course I have already outlined and only served to strengthen the importers' position and antagonize some customs official against you and your industry. Whether you did much or little, and even if successful, you had expended your efforts and borne the expense of a matter which, in fact, should have been handled by all domestic producers whose market was under attack.

Inception of Import Committee

By the year 1924, the situation had become so intolerable that you, gentlemen, came seriously to the consideration of ways and means to deal with it. At that time it so happened that your then president, Mr. Fearing, came to me and stated your desire that I formulate some plan for dealing with the problem. For some time I had known of this situation that I have attempted to describe to you. I had represented American manufacturers who had been bearing the burden of single-handed combat with certain forms of unfair competition, which, in fact, similarly affected an entire group of the industry of which my clients were but a unit. In such instances, our manufacturers had borne a burden that should have been borne by all who were affected.

This phase was bad enough. But such a situation was fought with a real danger, and that was when one or two men so affected undertook to deal with the situation single-handed; where was the danger of conflicts and cross purposes. The incident confusion was more than likely to result in failure. Moreover, in such conflicts, the resulting confusion operated to bring about a state of bewilderment in the Treasury Department out of which any suitable adjustment of the difficulty was hardly to be expected. In this state of affairs I accepted your commission and set about to organize some co-ordinated effort. But for your action, I wonder what would now be the situation?

Complying with Mr. Fearing's request, I formulated and submitted to him the suggestion of an organization which today is known as the Import Committee of the American Paper Industry. Mr. Fearing christened this suggestion with the name of "The Wise Plan," and as such he submitted it to the industry.

In April, 1924, I was your guest at a dinner at New York. I then outlined to you the so-called "Wise Plan." I told you then that I did not claim for it the quality of perfection and pointed out that if adopted and put into operation you must not look for immediate results. I told you that it was an experiment that would require a full and fair test; that its success must depend not only upon its intrinsic merit but also the men who were to be placed in charge of its operation. I explained that, in my opinion, a period of at least three years would be required in which to demonstrate its efficiency. I emphasized the importance of the wholehearted support of the industry; and that as the work of the organization was to be for the benefit of the entire industry, it was but fair that every branch of the industry and every man of every branch should contribute to the expense. Here let me pause to reiterate this last statement.

The plan was adopted and in August, 1924, the Import Committee was organized. By the month of October, 1924, the plan had such assurance of support from the industry that the committee felt justified in employing the necessary help to put the plan into operation. Thus you will see that we are now at the end of the three-year tryout period. And now I think I am justified in saying to you that the tryout has proven a success. The organization has been shaken down and now is in excellent working order and that the so-called Wise Plan has proven to be, and is in fact, a wise plan.

Method of Procedure

The organization—I shall not undertake to describe to you all of the details of the organization. Nor will I burden you with the statistics of the work done. Briefly stated, the organization consists of a committee of five gentlemen representing various branches of the industry. Under them are:

1—A manager in general charge of all of the affairs of the committee.

2—A fully experienced customs expert who is in close contact with our Treasury officials, and ever watchful over every importation of foreign paper and alert to see that all necessary information is available to customs officials having to do with the determination of all questions of valuation and classification of all such paper.

3—An experienced customs expert with headquarters in Europe who is in close contact with all of the European agencies of our Government. This representative is employed in keeping watch over all movement of paper from Europe to America and informing American headquarters of the course of all such movements. Also in keeping watch over European manufacturers of paper, studying their manufacturing methods and costs, their markets and market conditions, and in securing any and all available information that may tend to throw light upon or disclose attempts at dumping, undervaluation, misclassification, or other methods of unfair competition.

4—A legal staff expert in customs law, constantly advising with all the agencies of the committee and actually assisting in the trial of many cases before the Customs Court.

Most of you are acquainted with the gentlemen who compose the committee. Through them the employees of the Committee have access to the entire industry. From the industry they are enabled to secure any and all information that may be required for the solution of most any problem that may arise concerning the quality or value of any class or kind of paper. By their demonstration of fair dealing, the employees of the committee have gained the confidence of the customs officials having to do with questions affecting imported paper. As a result, such employees are consulted by such officials. These officials not only welcome but solicit the advice and assistance of such employees, and through such employees they seek for and secure information, which prior to the formation of the Committee, was practically unknown and rarely, if ever, availed of by the customs officials. Not only do they seek and welcome such information, but they also counsel with, and are glad to be advised by, such employers concerning questions affecting both classification and valuation of foreign merchandise.

Through its contacts at the various ports the Committee is able to detect and have corrected any lack of uniformity in the application of the laws. Through its harmonious relations with the customs officials it is able to correct these conditions. Thus, in the first instance upon the arrival of imported merchandise at any port, it is able to put into operation the proper and uniform application of the laws. Now instead of regarding the domestic industry as their enemy, the customs officials look upon it as their friend. Instead of looking to the importer as a friend they recognize him as having an adverse interest; and, instead of seeking his assistance or advice they recognize the necessity for careful scrutiny and, in many cases, for distrust of all information and advice from that source. The old antagonisms and errors are obliterated, and today the customs officers are proceeding along proper lines. The result is that up to date there have been before the Customs Courts approximately 3,000 classification cases involving the question of the proper rate of duties, whereas in the past, cases involving classification of imported paper were hardly known. It is no exaggeration to say that this has been largely due to the activities of the committee.

Many Appeal to Customs Court

The work of the Government, however, does not end with the reclassification of imports by the customs officers at the

various ports. The importer, except in cases where he knows he hasn't a chance to reverse the action of the port officials, pays his duties and protests. This fixes his right to a trial of the question. In the first instance, this trial is conducted before the Customs Court. For convenience this court sits in various parts of the United States. All of these cases are handled for the Government by an assistant attorney general and his assistants. You will realize that paper is but one of many commodities imported into the United States. And that questions arise as to value and classification of all other commodities. Therefore, there arise literally thousands of cases for trial before this Customs Court. In the old days when questions affecting imported paper came before the Customs Court the trial took the form of a proceeding where the importer appeared with counsel and an army of witnesses supplied by a very much interested party.

While the paper industry of America was not represented except that some deputy attorney general represented the United States, which was only interested in collecting its revenues, and he usually had other information than what was known to the customs official whose action was being challenged. This deputy attorney general was charged with trying thousands of customs cases involving many questions and all manner of merchandise. He had no adequate means of locating the necessary information either to sustain the action of the customs officials or to defeat the claims of the importer. You can well imagine, therefore, what was the outcome in many such cases.

Many cases were lost where the result would have been otherwise had the evidence available to the industry been supplied. This is no reflection upon the Government attorneys. They are men of absolute integrity and of no mean ability, but under existing conditions, it was impossible for them to make adequate preparation. On a few days' notice they might be called upon to try actually hundreds of cases and be sent to some remote place for such trials, there to be confronted by able counsel prepared to try each particular case and fortified with testimony supplied by the importer who was vitally interested in that particular case.

Since the advent of the Import Committee, the situation is very different. Today, because of its demonstration of fair dealing, the committee and its agents are proud to boast that they have the confidence and trust of the assistant attorney general and his deputies. They are now consulted by the attorney general; they are requested by him to supply him with necessary evidence to substantiate the action he defends. They follow up every case on the calendars. They co-operate with the attorney general in the preparation of his cases. They supply general and technical information only to be had from the domestic industry. They produce experts from the industry to give testimony on such subjects.

In important cases, the customs experts and the counsel for the committee are present and render such assistance as may be required. The Judges of the Customs Court recognize that the American industry had an interest in the proper determination of all such questions. In paper cases they accept and rely upon the testimony of the committee's customs experts. They welcome arguments by the committee's counsel. The result is that customs cases involving questions of classification and valuation are more numerous today than ever before; they are being tried more intelligently than ever before, and the dishonest importer is finding his road more difficult than ever before. The increased number of cases merely indicates the number heretofore that went undetected.

By demonstration of its purpose to uncover and prosecute, or have prosecuted, every attempt at unfair practices affecting paper importations, and by its demonstration of absolute fair dealing and of its desire not to assist or prosecute any unfair claims, the committee and its agents have been gratified to be consulted by many importers who have acknowledged them and accepted their advice concerning many importations. By this means, they have eliminated many controversies that might have arisen when no evil motive was involved. On the other hand, they have put the fear of God into the hearts of other importers who now make correct entries of their merchandise for fear of detection should they do otherwise.

But do not be deluded into the thought that any general reformation has occurred or that fraudulent practices are at an end, or that they ever will be; and don't believe that the Import Committee's organization is perfect or that its batting average has reached 1,000. The organization is in good shape. The men are working full time and efficiently. They are on to their jobs and are making it hard for the dishonest importer. But we still have 10,000 miles of frontier, we still have dishonest importers, and we still have Customs officials who do not yet know every class and kind of paper. Our task involves eternal vigilance. The enemy is forever scouting our lines. Wherever he can find a loop hole he will try to come through. Of the 3,000 cases before the courts, so far, 1,000 have been disposed of. The other 2,000 are yet to be tried. An error or a failure in any of these will let in a flood of imported paper. Before these 2,000 cases are disposed of another 2,000 will arise, and so on and on late into the night. Many of the cases already decided have meant a great benefit to one or another branch of the industry.

I might cite instances, but those of you who have benefited know it is safe to say that never in the history of customs have paper importations received such close scrutiny of customs officials as at present; never before have customs cases involving importations of paper been tried with such care as at present; never before was there a time when importers consulted the American paper industry before entering their merchandise; never before have importers sought advice of customs officials both as to valuation and classification before making entry of their merchandise; and never before has every American manufacturer of paper been represented before the courts by his own lawyers and customs experts in the trial of every case of importance when the decision might affect his interests. These conditions have been brought about by the Import Committee. As I have before stated, the committee has accomplished much. There still remains, and always will be, much to do.

Continued Support Essential

The committee has not done all that it could have done. It hopes to be able to do more hereafter. What it has done has been done for the entire industry. What it has accomplished, has benefited the entire industry. What it will do will be done for, and will be for the benefit of, the entire industry. Up to the present, the committee has had the support of a very substantial part of the industry. It should have had the support of the entire industry. The committee's work can not stop; it must be carried on. To stop now would mean a return to conditions worse than before. Let it be known that the Import Committee has ceased to function and the flood of foreign paper to follow will overwhelm the entire industry. You, gentlemen, have put into operation an organization of which you may well be proud. It has gone through its trial period. It has been shaken down and is now working with precision and efficiency.

The men you have placed in charge of this work have so conducted the work as to gain the respect and confidence of our Government, the respect of all honest importers, and to inspire fear in the heart of all dishonest importers. They have eliminated many harassing practices that caused your industry annoyance and financial loss. What they have saved for you, measured in dollars and cents, cannot be calculated. But this we do know, that which you have had for what it has cost, has been the largest insurance for the smallest premium than any of you have ever paid.

Let me conclude with this plea to the gentlemen of the industry who up to now have not continued their financial support. This work is your work. It is being done for you. Whether you see the results or not this committee is keeping poachers off of your preserves; it is watching every pound of paper that comes into the American market so far as its abilities and its resources wil permit; it stamps upon, and will continue to stamp upon, every unfair practice affecting anything denoting paper. Like Cascara, it works while you sleep. It does not claim to be perfect, but it is proud of its work to date, and ambitious to accomplish even more in the future. So please step up and become a full partner and share in the liabilities as well as the assets.

The Pulp and Paper Industry of the Pacific Coast

Conditions that are Likely to Influence its Development

By Hugh P. BAKER

Executive Secretary, American Paper and Pulp Association

A BRIEF report on an investigation of six weeks, made during July and August, 1927, of the pulp and paper industry as it now is developed on the West Coast and of conditions influencing further development of the industry should be of greater interest and value if proceeded by a very brief description of the three states in which the development of the industry is now proceeding. Such a brief description may be of assistance in estimating present and future markets on the Coast.

The natural conditions of geographical location, climate, forests, water for process, power and transportation, raw materials and fuel, are of prime consideration in the erection and operation of pulp and paper mills in the Northwest as they have been in the East and South. These will be discussed briefly for the three states under consideration:

WASHINGTON has a land area of 42,775,040 acres with splendid harbors throughout the Puget Sound Section and on the lower reaches of the Columbia. There are but few good harbors on the Coast facing directly on the Pacific Ocean. Less than a third of the State lies west of the Cascade Range, where very considerable rainfall and the influence of the ocean have through the years produced marvelous virgin forests of softwood timber. Nearly two-thirds of the State lies east of the Cascades where rainfall is limited and forests, where they occur outside of the higher mountain slopes, are of comparatively little commercial value. This condition is emphasized by the fact that the wood-using industries of the Spokane section must go eastward into Northern Idaho or northward into Canada for wood supply. The population of the State, estimated for 1926 is 1,538,228 which is equivalent to about the population of the cities of Baltimore and Boston. The Columbia River, which is one of the great rivers of the country, is navigable for a few hundred miles from its mouth only. However, where navigable it affords splendid means of transportation, with ocean-going vessels docking at Portland.

OREGON has a total land area of 61,188,480 acres and a population estimated for 1926 at 877,477 which is less by 100,000 than the population of the city of Cleveland. As in the State of Washington, the Cascade Range runs north and south through the State giving the western third of the state splendid virgin forests of almost pure softwoods. With the exception of the Blue Mountains in Northeastern Oregon, the Eastern two-thirds of Oregon has little forest and over great areas the rainfall is so small that irrigation is necessary for the satisfactory practice of agriculture. The western third of Oregon is less favored in the way of satisfactory harbors than the western third of Washington. There is considerable difference in the character of forests in southwestern Oregon from those of Northwestern Oregon and Western Washington. The forests will be described more at length in the remainder of the report.

CALIFORNIA is the largest of the three Pacific States, having a land area of 99,617,280 acres and a population estimated in 1926 as 4,316,459 people which is about equivalent to the cities of Chicago and Detroit. This State is traversed north and south by the Sierra Mountains and the Cascade Range extends more or less continuously from the northern boundary through the section close to the Coast immediately north of San Francisco. California has excellent harbors from San Francisco south but very few from San Francisco north.

Because the three West Coast States extend from the Mexican to the Canadian border and from the entire West Coast line of the United States, their area appears much larger than an equal number of middle western states. They are in fact approximately equal in area to Texas and Iowa combined.

Climatic Conditions

The climate of the States of Washington and Oregon, in particular, is affected very beneficially by the Japanese current which flows northwestward in the Pacific, finally influencing Alaska in a very beneficial way. On the immediate western slope of all three states, north of San Francisco, the rainfall is very considerable and the climate is equable. This section seldom feels wide fluctuation in temperature and there can be little question but what climatic conditions favor industrial activities particularly in Oregon and Washington, as compared with the Northeastern and Lake States.

There is some feeling in the Northwest that because of equable climate it will not be necessary to go to the expense of as permanent pulp and paper mill construction as in the East and Middle West where climatic conditions are more severe. While it is a fact that it is not, generally speaking, necessary to resort to construction of a character that will allow of heating of buildings during the winter, yet competent engineers are urging construction on a basis of reasonable permanence to the end that machinery and equipment may be easily protected from freezing weather. The tendency to build in a light or flimsy way, because of climatic conditions, is one which may bring serious and expensive results in the years to come.

While at certain seasons of the year it would seem as if there was water, water everywhere on the immediate West Slope, yet even with heavy and long continued rainfall and splendid navigable rivers and the wonderful Puget Sound, the water problem from the standpoint of use in mill processes is as much a problem on the West Coast as in any other paper mill section of the country. This is emphasized by recent experience of those interested in the development of the industry at Tacoma, Astoria, Pt. Townsend, Bellingham, and elsewhere. As an example of the water problem, confronting communities where mills are being built or projected, the Secretary of the Chamber of Commerce in a community, who proved to be a master of description in referring to an abundant and unexcelled water supply, was diputed by the manager of a pulp mill almost next door to the Chamber, who indicated a supply of water so filled with vegetable matter that expensive treatment must be given. Generally speaking, however, the West Slope in Washington and Oregon is as well supplied with water for mill processes as any of the middle western or eastern and southern paper manufacturing states. A thorough understanding of the water situation as affecting water for process, power and transportation is fundamental to the future satisfactory development of the industry in the Northwest.

As far as the building and operation of pulp mills are concerned on the West Coast, and with the exception of groundwood mills, water power is an unimportant factor in the production of pulp. For sulphite, soda and sulphate mills, it is generally understood that the cost of power does not represent more than four or five per cent of the cost of producing a ton of pulp. Generally speaking with cost of labor and building material much the same in the Northwest as in the East, there is probably not a great deal of difference in cost of developing power plants and power east and west.

Whether low cost power, produced by publicly owned plants, can be depended upon to continue as low cost power over a period of years is a question which has not yet been answered.

As far as water for transportation is concerned, there is probably no section of the United States of the size of the West Slope of the State of Washington that is so splendidly supplied with natural waterways. The West Slope of Oregon, however, with the exception of the navigable portion of the Columbia and a few harbors on the Coast, is not well supplied with natural waterways. So too, with the State of California, outside of the few fine harbors from San Francisco south, there are a few waterways which are particularly advantageous to developing industries.

Forest Conditions

Washington and Oregon will be considered together in discussing forest conditions. No section of the United States, within the history of the country has been any more favored with splendid virgin forests than the West Slope of Washington and Oregon, The U. S. Forest Service estimates that the States of Washington, Oregon and California contain one-half of the remaining saw timber of the United States and one-quarter of the pulpwood. This last figure as to pulpwood cannot be a very accurate figure, as the Northwest does not as yet differentiate as clearly between saw timber and pulpwood as the Eastern and Southern states. These western forests are made up almost entirely of softwoods with few, if any, hardwoods of value. Both from the standpoint of density of stand and luxuriance of growth, no forest area of the United States, since the formation of the nation, has been favored with such forests as the softwood country of the West Coast. Government experts estimate that there is still standing in the States of Washington and Oregon approximately six hundred billion feet of timber. In considering the present stand of timber, however, the present rate of cutting must be considered. The cut in these two states last year was estimated to be approximately eleven billion feet, and with a number of new saw mills of large size projected on the Coast, it seems likely that the annual cut will increase for a time at least, rather than decrease. There is every indication that the virgin forests of the Northwest must go the same way as the virgin forests of the Northeast, the Middle West and the South have gone.

The principal tree species in the Northwestern States and those upon which the pulp and paper industry must depend, given in what seems the order of importance to the industry, are Western Hemlock, Douglas Fir, Sitka Spruce, White Fir, Sugar, White and Yellow Pine. None of these species occur in the forests of the East or South. There is much less Sitka Spruce in the Northwestern States than has generally been understood by the wood-using industries of the East. The Spruce, however, is of such great value in the manufacture of pulp and paper that efforts are already being made to perpetuate it by both natural and artificial reforestation. As Japan has doubtless gone into Manchuria and Eastern Siberia, in large part because of the spruce forests there, so the industry on the West Coast will doubtless go up into Alaska for the available spruce there. Hemlock appears to be the principal wood upon which the western mills must depend in the immediate future. Red Fir will be used in increasing quantities as technical processes are perfected for the use of this species in the manufacture of sulphate pulp.

Because of very favorable climatic conditions, regrowth on the essential forest lands of the Northwest may be counted upon to produce large supplies of pulpwood in years to come. While studies of rate of growth in second growth forests in the Northwest have not been carried to the point where accurate comparisons can be made with the growth of second growth forests in the South and Northeast, yet from such studies as have been made, it would appear that the rate of growth will equal or exceed that of softwood species in the East and possibly in the South. It seems very probable also that it will be possible to produce larger quantities of wood to the acre on the essential forest lands of the Northwest than in the East or South. The question of utilization of woods waste and saw mill waste will be discussed later but in speaking of second growth it seems more than probable that dependence of the mills upon second growth in the future will be much sounder and more satisfactory than the dependence upon waste wood from any source.

Economic Conditions

In connection with the discussion of the natural conditions which influence the production of pulp and paper on the West Coast, it would be in place to refer briefly to certain factors which are economic in character and, therefore, largely to be controlled by the industry as it develops.

Labor—Labor costs in the pulp and paper mills now operating on the West Coast are probably but little if any more than labor costs in the Eastern and Middlewestern mills. This is true both as to skilled and common labor. The character of labor is much the same west and east, and there is no reason to believe that the labor situation in any of its aspects will vary to any considerable extent in the future as between the Northwest and the East. Because of the lure of the West and the resultant tourist or homeseeker, and climatic conditions, there is no labor scarcity at the present time and no indication of a scarcity. From observation, and without consulting labor statistics, there would appear to be more men unemployed, at least in the cities of the Northwest, at the present time, than in Eastern cities.

Transportation—Naturally in a large area such as the Northwest which is still somewhat sparsely settled, transportation facilities are not quite as well developed as in the East and South. The casual observer, however, is amazed at the character and extent of highways already built. Transportation and market are closely tied together. With few if any of the paper mills on the West Coast finding a market for all of their products west of the Rockies, there is, of necessity, a real problem of transportation confronting these mills. Generally speaking, the cost of producing pulp and paper on the West Coast is not materially different from that in the mills on the East Coast, with the one exception of pulpwood. In considering marketing and transportation, the West Coast mills will find it necessary to balance low cost wood in part against the higher cost of sending the product to the market. Today it costs between $7.00 and $8.00 to ship a ton of pulp from Northwestern ports through the Canal to Eastern ports. Northwestern pulp mills, sending their pulp into the Middle West, are met with a freight charge of from $12 to $14. Transportation is so much more of a problem for the Northwestern mills than for the Eastern mills that it is believed the Northwestern mills will be forced to meet this problem on an aggressive and unified basis, perhaps, not yet fully appreciated by the Eastern or Southern mills.

Market—The pulp and paper industry is no exception to the other industries in this country facing the fact that it does not pay to produce unless the product can be put onto the market at a profit. Of all of the factors entering into the future development of the industry on the West Coast, the market is the most important one, and yet it would seem as if this factor is not being given the consideration which it should be given by those considering new developments on the Coast. As far as paper is concerned, it is safe to say that the limited market west of the Rockies could be taken care of by mills already operating on the Coast with the exception possibly of a few grades of paper. However, with a free and open market throughout the land, the western markets are as free to the mills of the East and the South as they are to West Coast mills, and many eastern mills are merchandising their paper on a satisfactory basis on the West Coast. This has brought about a condition that should give serious thought not only to western mills but to the industry of the country as a whole.

A common statement and argument on the part of promoters, lumbermen and bankers in the Northwest, is that with the tremendous amount of waste in the woods and at the saw mills, it should be possible to manufacture this waste into pulp and ship it to the Eastern mills to take the place of the million odd tons of pulp imported into this country annually from abroad. The easterner who sees the waste of wood in the forests of the Northwest and at the saw mills,

is as much impressed with the seriousness of waste as anyone. However, the suggestion that this waste can be manufactured into pulp and shipped east to take the place of the imported pulp, is a very appealing one, particularly to the lumberman and others who find the waste a serious burden and whose business may not be as profitable as it should be, and particularly to those who would like the help of eastern financial institutions to build up western communities. It is safe to say that in time pulp can be produced on the West Coast in quantities to replace imported pulp but only under certain strenuous conditions—first, that western pulp mills shall make as good, clean, strong pulp as that now imported from abroad and, secondly, at a cost that will make it possible to lay the pulp down at the Eastern mills at a price below that at which the imported pulp can be sold. In any event it is reasonable to expect that Western pulp mills will have to meet the price of foreign pulp at equal quality. These conditions are so important to the future of the pulp industry on the Coast that they should be analyzed most thoroughly, particularly by those who believe that industries should be developed only where there is definite assurance of soundness, permanence and profit.

Capital—Conditions are such in the pulp and paper industry of the country today that its chief competition is not from other commodities or foreign pulp and paper but from capital. A prime requisite in the development of any pulp or paper mill is that there shall be a thorough investigation made by a financial expert of the financing and operation of the plant. It is estimated roughly that it costs from twenty to twenty-five thousand dollars per ton of daily capacity to build a modern pulp mill and from thirty to thirty-five thousand dollars per ton of daily capacity to construct a modern paper mill. These figures do not include power, raw materials or working capital. Furthermore, on the basis of experience in the building of pulp mills in the East and South, it is more evident that a minimum sized unit for the profitable production of pulp is a 100 ton mill.

Experience generally in the development of industry in this country has shown that it is as dangerous to the future of a plant to be under-financed or high financed as to be improperly constructed and managed. Those planning the development of pulp and paper mills on the West Coast must depend largely upon the eastern money market for their funds. It is vitally important to the industry therefore, that the banks of the country should understand thoroughly the large capital involved in the building and profitable operation of a modern pulp and paper mill.

Because of the necessity for new pulp and paper mill developments on the West Coast to come to the eastern money market, there is every reason to believe that the ownership of the industry on the West Coast will rest in the hands of the public and the banks more largely than in any other section of the country. This should give concern to those who are most interested in the future sound industrial development of the Northwest, particularly banks, Chambers of Commerce, and other industries. One or more failures which might result from inadequate or unsound financing, or lack of care in location, construction and management, might give the industry a setback that it would take years to overcome.

Regardless of the fact that the great forests of the Northwest, which are the source of raw material for the pulp mills, and which will continue to be a great reservoir of raw material as the years pass, contain tree species somewhat different in character from the tree species of the Middle West and East, and regardless of the fact that the West Coast States are separated from the industry in the East and Middle West by an area almost continental in size, it should be kept in mind that fundamentally and in detail the pulp and paper industry of the West Coast is the same as the industry now so well organized in the East and the Middle West. There is some tendency on the part of promoters, paper mill consultants and bankers in the West, to indicate that those concerned with the pulp and paper industry of the West speak a different language from pulp and paper manufacturers of the East. This may be true as far as the use of different tree species for the manufacture of pulp is concerned, but it is certainly not true when one considers the basic economic factors of the industry, continental and world markets, the human factors of the industry, etc. It must, therefore, be kept in mind that the industry on the West Coast and the East is one industry and that factors affecting the industry favorably or otherwise must be met and solved in the Northwest as in New England and New York, the Middle West or the South.

With the Northwestern forests a reservoir of future pulpwood, with an equable climate favoring industrial development, and with factors of water, power and transportation equalling those of the East and South, there can be no question of large development of the paper and pulp industry in the Northwest in the years to come. However, the ferment of promotion now working on the West Coast has elements of real danger in it in the way of over-building and overproduction. There must be concerted effort on the part of the pulp and paper industry as it now exists, West and East, financial interests and the investing public, to see that this future development as it comes is on a sound, permanent and profitable basis.

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Part II—Yesterday, Today and What of Tomorrow

Pulp and paper mills have been operating successfully on the Pacific Coast for many years. However, recent articles in the daily press of the West Coast and statements by lumbermen, promoters and others in the Nortl.west, have given the impression, at least to the general public, that the pulp and paper industry is a new industry on the Coast and that because of its very newness there is rare opportunity for the investing public to get in on the ground floor of the industry, as the phrase is so easily used by the promoter and the bond salesman.

The pulp and paper industry itself and the paper merchants who have built up a satisfactory business on the West Coast know very well that the pioneer work in the development of pulp and paper mills on the Coast has been done. Great credit is due to the men who went into the West and built pulp and paper mills and adapted their technical processes to new tree species and produced paper that has not only satisfied the local western market but that has been put into successful competition in the markets of the Americas and in eastern Asiatic and Australian markets.

The first paper mill on the West Coast was built at Camp Taylor, California, about 1850 by W. P. Taylor. The materials used in the Taylor mill were rags, old burlap and paper stock and the products were chiefly manila paper and fruit wrappers. This mill was operated successfully for a number of years by the five Taylor brothers. After a time the original mill was abandoned and a larger one built which proved a failure.

The next mill to be built was located at Alviso Creek in San Jose, Cal., and was built by James Lick, in 1852. While the mill was intended originally as a flour mill, it was later sold to M. Waterman & Co., and Blake, Collins & Co., who already owned a paper mill at Saratoga, New York. They put in pulp and paper mill machinery and attempted to manufacture wrapping paper from cactus pulp but the experiment was not a success and in 1878 the property was sold to A. D. Remington & Co., of Watertown, N. Y. The mill was reorganized and from 1878 to 1882 it produced from one to two tons of manila paper and bags daily from straw and paper stock.

In 1875 a mill was built near Stockton, Cal., by Albert Dibble and others, using straw for making print paper. The mill was not a success and the stockholders disposed of their interest to Henry Pierce, who, realizing the value of the waterpower in Oregon City, abandoned the mill at Stockton and moved the machinery to Oregon City and established there the Willamette Paper Company, which was the first successful paper company on the Pacific Coast and was the beginning of the present successful Crown Willamette Paper Company. It is interesting to note that the first paper produced by the Willamette Paper Company, of Oregon City, was manufactured from straw but later the mill was put on woodpulp

production. This mill may be said to be the first really successful pulp and paper mill on the Coast.

Plants in Operation, Building or Planned

At the present time there are forty-six pulp and paper mills and converting plants in operation or in process of construction in the three West Coast States.

(Editor's note: A list of these mills, showing products and listed capacities were given in the complete report.)

Looking Forward

As much of the discussion among promoters, lumbermen, bankers and others as to the possibility of profitable development of new pulp mills in the Northwest seems to be based upon the possibility of using waste wood from logging operations and the saw mills for the manufacture of pulp, it would be in place to discuss briefly the value of waste wood for the manufacture of pulp and the possibility of dependence by the pulp mills upon a supply of waste wood.

As indicated previously, the promotive effort of those who are looking to the building of pulp mills as a solution of the industrial problem of the Northwest seems to be focused upon what appears to be the simple problem of converting the tremendous amount of waste resulting from logging operations and at the saw mills into pulp that can be shipped East to replace imported pulp. To the layman who knows only that woodpulp is made from wood and who has no idea of the cost of cleaning or handling wood, it appears indeed a simple problem to take the waste wood, which seems to be everywhere in a logging operation, or the mountains of waste wood at a saw mill, and feed this wood in at one end of the pulp mill and have it come out at the other end in the form of pulp ready to be shipped East to replace foreign pulp.

There are, however, certain fundamental factors which must be given consideration in converting wood into good clean pulp and that on a permanent and profitable basis. In the first place, to operate a pulp mill at a profit means running continuously 24 hours a day for 300 days a year. For a 100-ton mill it takes a very large amount of good wood, properly cleaned and prepared, to keep a mill in continuous operation. To keep a 100-ton pulp mill, which is a minimum practical unit, in operation 24 hours a day for 300 days of the year, it is estimated that approximately 70,000 cords would be required. Converting this cordage into board feet, it would require approximately 35,000,000 board feet in log form per year. There are few if any saw mills in the United States, which, as operated today, would keep a 100-ton pulp mill operating year after year entirely on the waste from the mill. Not but what there are saw mills producing waste in quantities to keep a 100-ton mill in operation for months, and perhaps years, but very few saw mills run continuously for 300 days a year and the fire danger in saw mills is great. No pulp mill could run the risk of an intermittent supply of raw material.

The cost of handling waste from the woods and from saw mill or woodworking plants is high. The number of pieces of wood which must be cleaned thoroughly of bark and of knots to produce a unit of chips ready for the digester is very much greater than the number of pieces of round wood in pulpbolt or log form. The apparently simple item of cost of handling has become such a serious one in woodworking plants seeking to use waste that many of these plants have given up the use of waste, finding it much cheaper to buy wood in the form of new logs. The experience of the match companies in the Northwest in this matter would be very enlightening to those considering the use of waste for the manufacture of pulp.

The amount of waste produced in a logging operation or by a given saw mill is usually overestimated. It must be remembered that this wood is waste and that after the rotten portions, the bark and the knots are removed, as they must be before the wood can be chipped for pulp, the amount of clean wood remaining is usually much less than expected. Because of the wide variation in condition of waste as it might be brought from the woods or as found at the mills, it is very difficult to make any satisfactory estimate of the shrinkage which may occur after the wood is thoroughly cleaned. Furthermore, it is exceedingly difficult to get accurate figures of any kind as to the available amount of waste in the woods or at saw mills in any given section. Before decision is made to build and operate a pulp plant of any size to use waste continuously, there should be the most thorough investigation, not only of the amount of waste available today but of the amount of waste which could be assured the mill, day in and day out, for 300 days a year and for 5 and 10 and 20 years ahead.

Good pulp can be manufactured from waste wood from logging operations and from saw mills, but it has long been the experience of the pulp industry in this country and in northern Europe that no pulp mill can depend for any length of time for its raw material entierly upon waste. The experience of certain Southern mills in attempting to depend largely on waste wood for the manufacture of pulp would be very enlightening and should be investigated by the new mills of the West proposing to use waste.

In Sweden, where the co-ordination of the saw mill and the pulp mill has probably been carried further than any other country, there is no pulp mill so far as it has been possible to ascertain which depends entirely for its raw material upon saw mill waste. In every case there is a reserve of new wood in the form of pulpwood or logs which must be available at all times to keep the pulp mill running continuously.

The enthusiasm of promoters and others on the West Coast has carried them to the point of suggesting that so much waste wood is available or that saw mills can be tied up with the pulp mills in such a way that wood will cost practically nothing. When one considers the cost of cleaning wood thoroughly of its bark, knots, rotten portions, etc., and the cost of handling a great number of small pieces necessary to produce a unit of chips, it is manifestly absurd to make the statement that the wood cost will be little or nothing at the pulp mill.

With the tremendous production of lumber and the remanufacture of this lumber in the Northwest, there can be little question that there is a large amount of available waste wood for the manufacture of pulp. It is certain, however, that one of the big problems before any pulp mill in the Northwest which proposes using waste wood in large part or entirely is the production of high quality pulp, that is, pulp so clean and strong that it will compete successfully in the Eastern markets with foreign pulp. One of the greatest misfortunes which could happen in the development of the pulp industry in the Northwest is for that section to get the reputation of turning out low grade pulp, that is, pulp that is neither strong nor clean. There is real danger that this undesirable reputation may come to the Northwest unless very great care is taken.

Use of Small Trees and Waste from the Woods

Some very practical experiments are being carried on to determine the most practical and the most economical methods of utilizing small trees from 6 to 18 inches in diameter which up to this time have been largely destroyed and wasted in the logging of the larger size trees.

The serious waste in logging operations which makes such an appeal to the uninformed layman who knows little or nothing as to the practical logging of the big timber on the West Coast, has in the past been largely an unavoidable waste, in fact what might be called economic waste. For many years, the cost of logging and the fact that the market would not take small sizes made it impracticable to remove the small trees either before or after the main logging operation. The logging of big timber is a real engineering problem and under modern methods of logging it has apparently been impossible to prevent the smaller trees, ranging in size from 6 to 18 inches, from being broken down and wasted. This economic waste has been one of the serious problems through the years of utilization of our virgin forests, and often the lumberman has been blamed for carelessness and waste, without appreciation of the fact that the removal of the small trees could not be made economically and that any company required to remove them would probably go into bankruptcy.

As in other sections of the country where the logging of

virgin forests on a large scale has been completed, the Northwest is beginning to find that it must constantly go farther back into more inaccessible regions for its timber; therefore, gradually the small trees which have not had commercial value in the past, are beginning to have such value.

Two or three pulp and paper companies owning timberlands in the Northwest are carrying on very practical experiments to see if small timber cannot be removed on a practical basis either before or after logging. One of these companies, by throwing lighter equipment into the woods after the larger timber has been taken out, is removing approximately 10 per cent of the original stand in the form of small trees from 6 to 10 up to 18 inches in diameter. In places, of course, these smaller trees are badly broken up and the effort referred to is an experiment as yet as it has not been definitely proven that the removal of the smaller trees, broken up as they are after logging, is more practical than the removal before logging.

Another company is experimenting with the sending in of cutters on contract basis to cut and pile the small wood up to the minimum size considered practical to log and then following the regular logging the wood is being taken out on roads built for the main logging operation. Satisfactory figures as to the cost of these efforts to use the small size trees are not yet available. The U. S. Forest Service, through certain of the district offices, are investigating these forms of closer utilization and doubtless in time will be able to submit accurate figures.

What may be considered a secondary value accuring from removal of small trees from the forest either before or after logging is the marked reduction in fire risk resulting from the cleaning up of the logged land and the leaving of the land in much better condition for a valuable second growth.

There can be little question but with the passing of time and the increasing scarcity of saw mill waste, which is now so generally used for log fuel and for chipping for pulp mills, it will be practical and profitable to take out the small trees described above either before or after the main logging operation as may be determined most practical.

This statement as to the utilization of waste wood emphasizes the recommendations repeated earlier in the report as to the necessity for the most thorough invetsigation of all of the factors entering into the satisfactory building of pulp mills to be operated at a profit.

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Part III—Promotional Efforts and Basis for Sound Development

The tendency of the American people to judge the standing or the success of a community or a state by the rapidity of its growth of population and wealth, rather than by other factors which may mean as much or more to the daily lives and contentment of the people, has caused villages or cities as they have grown up in each new section of the country to focus community activities upon promotional effort or in other words upon the boosting of the community. As the stream of population has flowed steadily westward and as villages and cities have grown at vantage points in lines of travel, or at points of abundant natural resources, there have always been a sufficient number of "natural born promoters" in each community to keep the ferment of promotion working for more industries and more people. In many new communities this ferment of promotion has resulted at times in unhealthy and unstable growth with resultant retarding of normal healthy growth.

In many respects the Pacific Northwest is a new country. There are still undeveloped natural resources capable of giving wealth through exploitation. A ferment of promotion seems at work particularly in the smaller communities throughout the Northwest. Doubtless this must be expected in such a new section of country and particularly where there is a wide-spread feeling among business men and others that what the country most lacks is more industries and more people. The common belief seems to be that the securing of new industries will solve completely the apparent difficulties of limited payrolls and limited local markets and that more new industries and new people would mean better standing and more importance as communities and states. The most obvious and the most available natural resources of the Northwest now capable of immediate exploitation seems to very many to be the remaining stands of virgin timber and the developing second-growth forests—to be turned into lumber, pulp and secondary wood products.

The Lumberman's Part in the Development of the Northwest

As in the other great sections of the country covered with virgin forests, industrial development on the west slope of the Northwestern States was begun and has been continued by the lumberman. Gradually the center of lumber production in the United States has moved from the East to the Middle West, thence to the South and now to the great Northwest. Unbridled competition, an unsatisfactory and destructive method of taxing forest lands and growing competition from other commodities have brought the lumber industry of the Northwest to the point where it is facing "prosperity without profit"; and yet the production of lumber goes on apace. It has always been true that the lumber industry, not only in this country but in Europe, when it reaches the point of large production and small returns, turns its eyes to other seemingly more profitable phases of utilization; hence today many of the lumbermen of the Northwest are turning their eyes to the apparently greener fields of the pulp industry as a solution of their problem.

It would appear to be the old story of men being willing to face the unknown rather than to live longer with the troubles too well known—hence the efforts of a seemingly profitless industry to break away from overproduction and decreasing returns. This situation, coupled with the feelings of the community-at-large in the Northwest that it is moving too slowly in the improvement of its standing in population and wealth, is causing the Northwestern States to turn in desire and hope to the possibility of building a profitable business in pulp and paper on the basis of forests which must be cut plus the apparently inexhaustible supply of waste wood in the forests and at the saw mills.

Necessity for Sound Industrial Development Being Recognized

With all of the desire for growth, and with all that growth means in the Northwest, there is unusual appreciation on the part of many that the future growth of the country must be on a sound, permanent and profitable basis; that progress should be made slowly and that no industry should be welcomed unless it can contribute to the stability and the sound and wholesome advancement of the community. Hence the attitude of the pulp and paper industry as it was expressed through discussion before a number of public audiences in the Northwest during the past season is considered to be fair and reasonable. It was emphasized repeatedly that the industry has never opposed the sound and profitable development of new pulp and paper mills and is not today opposing such development. However, because of large capital involved, the many difficult factors entering into satisfactory building and operation and a highly competitive market, it was urged up and down the Coast that before the development of a proposed pulp and paper mill goes beyond the brain and tongue of the promoter certain fundamental investigations should be made.

First—that there should be the most careful analysis by a financial expert of the financing of the proposed plant. As stated previously it is estimated that it costs from twenty to twenty-five thousand dollars per ton of daily capacity to build a modern pulp mill, and from thirty to thirty-five thousand dollars per ton of daily capacity to build a modern paper mill, and these figures do not include power, raw materials or working capital. Second—that there should be a most thorough investigation by a competent paper mill engineer of the local factors which may influence the success or failure of the plant, such as site, water for process and power, transportation, labor and raw materials of all kinds. Third—that a merchandising expert should examine in a most comprehensive way the market for the commodity which it is proposed to produce. With conditions as they are in the pulp and paper industry today this last investigation is almost more important than the first two.

With the promotive spirit waxing warm, it is easy to under-

stand the stories one can hear up and down the Coast, if one will but listen, of the large profits made by pulp mills now operating on the Coast. Efforts to get details as to mill profits from those talking new pulp and paper mill development seldom if ever result in statements that can be recognized as facts. Perhaps facts are the scarcest of all raw materials to those who are more interested in talking new and big developments than in recognizing the economic factors affecting industrial development. It is easy at times to find men who are almost offended when an effort is made to point out the necessity for sound investigation of financing, construction and market. In one instance, after hearing repeated stories of large profits made by a certain mill, actual investigation at the mill showed that because of certain difficulties which had arisen in manufacturing processes there was production and apparent prosperity but comparatively low profits.

Too often those who are looking at the apparently greener fields of the pulp and paper industry are the last ones to seek accurate information from those who have it to give. Without making effort to see whether the industry itself, through mills already in operation on the Coast, or through the association serving the industry, can give accurate information, these people are ready to say that of course the industry is biased and doesn't want further competition and therefore will not give accurate information. These same people have been ready at times even to condemn their local Chambers of Commerce when the industrial committee of the Chamber has urged sound investigation and that judgment as to the development shall be based upon facts rather than on appearances.

It would be useless to enumerate the projected pulp and paper mills which certain promoters would have us believe will soon be under construction. It is enough to list, as has already been done, those pulp and paper mills which are already in operation or building.

Sound Development Means Future Growth

The statement was made at meetings in the Northwest and it is repeated here that if the agencies concerned with the development of industry on the West Coast, that is, the industry itself, the banks, Chambers of Commerce and the investing public, will see to it that the pulp and paper mills now in operation are given a fair opportunity to increase their pay rolls and their profits, that future development will take care of itself. To put the matter in a different way, it is perfectly reasonable to assume that money for new development will not find its way on a satisfactory basis into industries which are today unprofitable or decadent. If the Northwestern states would appreciate the fact that the method of taxing forests is purely an economic and not a political problem and so change their tax laws as affecting forests that lumbermen would not be forced to cut the forest to pay their taxes, or to get a fair return on their investment before the taxes accumulate to the point of making the investment unprofitable, it is quite within reason to believe that the lumber industry might be put back on to a profitable basis. So long as the lumber industry, the pulp and paper industry or any other industry on the West Coast is maintained on a sound and profitable basis there need be very little fear as to the future satisfactory growth of these industries.

Wood Using Industries Dependent On Permanent Forests

An exceedingly important factor in the future of the pulp and paper industry on the Pacific Coast is the problem of maintaining the forests in productive condition. Even though estimates show that there is standing in the States of Washington and Oregon approximately 650 billion feet of saw timber, yet with a cut in these two states alone in 1926 of over eleven billion feet and new saw mills building or forecasted, it isn't difficult to see the end of these virgin forests unless aggressive action is taken to put them on to a permanent basis. While the Northwestern states are blessed with other very valuable natural resources, such as soil, minerals, fisheries, etc., yet it would seem as if the remaining forests and forest lands capable of producing new forests would always be the chief natural resource. The Northwest, being the last great center of virgin forests in the United States, should at least be able to profit by what has happened to the virgin forest of the Northeast, the Lake States and the South. It is inconceivable that the thoughtful men and women who have done so much to build three great states on the Pacific Coast are going to stand idly by and allow the history of forest exploitation in the East to repeat itself in the Northwest.

In making the forest and forest lands continuously productive, which is the great objective of forestry, the prime essential today is thorough protection of the forests from fire. Great progress has been made in the Northwestern states in this regard but so long as serious fires occur the goal of the forest as an insurable risk has not been reached. The American people are so intent upon the getting and the spending of money that they seem to have formed the habit of temporizing with some of our great national problems like forest fire prevention, prevention of floods and erosion, etc. We are ever ready to arise in our might and fight forest fires and floods after they occur but seem to be very loathe to apply effective preventive means. One has but to consider the vast sums of money which have been appropriated by the Federal Government and the states for so-called river and harbor improvement, with so much of the money going for the removal of silt and debris from our rivers and harbors, when it would have been sound economy to have spent at least a part of the money in holding the soil where it should have remained—at the headwaters of the streams. In the same way we spend vast sums of money for the fighting of forest fires, and it is very necessary and money well spent, but what we must accomplish is fire prevention. Anyone who has observed the cut-over areas of the West Slope knows how quickly the new forest starts and grows where fire is kept out.

Another vital factor in maintaining the virgin forests and in keeping forest lands productive is the right way of taxing forest land. This has already been referred to. It is difficult to understand how the system of putting an annual tax on growing forests came to be used in this country. The growing crop of the farmer is not taxed. Out of fairness and as a fundamental necessity in forestry, the growing crop of the forest owner should not be taxed annually. As with farm lands there should be a low soil or land tax assessed against forest land and then, because of conditions which do not affect the farmer, it is reasonable for the state to levy upon the forest crop when it is cut. Several of the states have passed rather satisfactory yield tax or forest crop laws. Washington and Oregon in particular should not delay following the example of New York, Michigan and Wisconsin in so changing the forest tax laws as to induce the forest owner to maintain his present crops and to produce new crops.

In any plan for maintaining the productivity of forest lands another factor must enter into the situation and that is artificial reforestation. In every forest region there are areas which have been so severely cut and burned that even though protected from fire they will not come back to a new forest. Only in these severely denuded areas on the West Slope will it be necessary to plant forests to bring the land back into permanent forest condition; however, planting is expensive and wherever reforestation can be secured without planting it will be the most economical solution of the problem for the present. Forestry agencies are thoroughly well organized in the Northwestern states, from the Federal Government down through the states to local communities and in some instances to organizations of timber owners. These agencies should be given the opportunity of extending their activities to the point of insuring the Pacific Northwest permanent forest resources.

Future Growth of the Industry In the Northwest

An analysis of the growth of the pulp and paper industry in the United States—and this industry has gone through much the same periods of growth as other industries—would seem to indicate that growth has taken place without conscious direction on the part of the industry itself and with little thought of what is ahead in the way of raw materials and market. In other words, the industry has grown like Topsy and the course of development has been followed without the help of chart or compass. New development has come largely through individual initiative and courage, or as the result of contest within the industry and perhaps this last course

of development is the natural outgrowth of the industrial philosophy which we have developed in the building of a new nation and a new country. In this hit or miss method of development, how often the failure to profit by the experience of others has resulted in wreckage and loss. Possibly industries, like individuals, must live and acquire wisdom by progressing through experiment and experience unrelated to previous experience.

As an example of what might be gained in the industry from the experience of others, one has but to observe the growth of the sulphate pulp industry of this country. There is every indication that the chief competitor of the developing sulphate mills in the Northwest will be the sulphate pulp industry of the South. As far as could be observed those proposing to develop sulphate mills in the Northwest are going ahead with little or no study of the growth of the sulphate industry in the Southern states. The sulphate industry of the Northwest cannot be materially different from that of the South and yet it would seem as if the Northwest must carry through its own experiments and have its own experience without building upon the research and experience of the South.

There is at the present time a well established pulp and paper industry on the West Coast. It would be exceedingly helpful in the future development of the industry if those who are planning and building new mills could but profit by the hard pioneer work that has already been done. It is but commenting on the history of the industry throughout the country to observe that some of those who are planning new pulp and paper mills on the West Coast are confident that because they have manufactured lumber or operated banks, or been successful in some other industry, they can as easily build and operate a pulp or paper mill on a profitable basis. One admires their courage but wonders as to the results.

Whatever one may think as to the value of the experience of others or as to the necessity of having the right kind of charts or compasses to assist in following the difficult course of future development of the industry, it is certain that there is no other country in the world and no other section of this great country that offers better facilities for the right development of the pulp and paper industry than the great Northwest, blessed as it is with virgin forests and the promise of new forests. If one will but enumerate the new developments and additions to already existing mills that have taken place in the Northwest in the last five years, it will be very evident that greater growth has already taken place in the Northwest in the past five years than in any other section of this country during the same period.

We may look for a still greater pulp and paper industry in the Northwest in the years to come. However, it is the hope of the industry itself and it should be the hope of every other agency working for sound and profitable industrial development that those controlling the funds which the industry must have to support profitable operation and growth shall see to it that future growth shall be based soundly upon the facts which have come out of the experiences and the experiments of the industry wherever it has been developed in this country or abroad.

Penn-New Jersey Supers Hold Meeting

Plant Visits, Luncheon and Banquet Feature Division's First Regular Assembly

THE Pennsylvania-New Jersey Division of the American Pulp and Paper Mill Superintendents' Association held its fall meeting on November 4, 1927 at the Newark Athletic Club, Newark, N. J. The meeting was the first regular assembly of this division since its inception. Much credit is due to the efforts of the various officers of the National Association, and particularly to the officers of the division headed by Charles L. Ellis of the Downingtown Mfg. Co., East Downingtown, Pa., for making this meeting a success. The officers of the division are to be congratulated for the splendid manner in which all details of the meeting were handled, and thanks are due to a large number of firms located in the vicinity of Newark for their assistance and support. Among the firms who contributed in putting this meeting across are American Oil & Supply Co., Cameron Machine Co., R. & J. Dick Co., Eastwood Wire Mfg. Co., General Electric Co., Heller & Mery Co., Hooker Electric Chemical Co., Manhattan Rubber Mfg. Co., Mathieson Alkali Works, Inc., Miner-Edgar Co. and the Paper Makers' Chemical Co.

Likewise, it seems that mention should be made of the ideal place for the holding of the meeting. The Newark Athletic Club, located in the heart of Newark is considered as one of the best appointed club houses in America. The atmosphere of the club was in itself conductive to a successful convention.

Eastwood Wire Manufacturing Co.

Registration began promptly at 9:00 A. M., and after a meeting of the division officers, the guests en masse left the club house in busses for the Eastwood Wire Mfg. Co., Belleville, N. J., where several interesting and helpful hours were spent by the visitors. For some, it was a new experience, for others it was a case of becoming re-acquainted with the intricacies of fourdrinier and cylinder wire manufacture. It was impossible for anyone observing the various operations to go home without a better understanding of the problems of this industry, and perhaps with a more sympathetic feeling toward the manufacturer. The process work in the manufacture of wire cloth was noted from the drawing and annealing operations through the weaving and actual shipment of the finished article. Guides explained in detail the purpose of each operation and thus made clear to the onlooker what was being done. At this plant, was also noted some of their work on sulphite mill specialties in the way of acid resisting bronzes.

General Electric Co. Host at Luncheon.

As soon as this plant visitation trip was completed, the superintendents returned to the club for a very delightful luncheon served through the courtesy of the General Electric Co. During the luncheon, Mr. W. W. Cronkhite of the General Electric Co. spoke briefly on the relationship existing between the electrical and papermaking industries, and gave many interesting statistics on the General Electric Co. He stated that approximately 4 per cent of the wood used in the United States goes into paper and he emphasized the fact that the public must be educated in the right direction. With approximately 22,000 periodicals and newspapers in the United States, and with a production of approximately 3,000,000 tons of newsprint in this country per year, he stated that these publications in using such a production were consuming enough paper if placed in a strip 13 feet wide to encircle the globe each year.

The qualifications of a superintendent were then discussed by Mr. Cronkhite. Particularly did he stress the necessity for the superintendent of being a natural leader. The personnel of the mill must be right and in his opinion every

paper mill of any size should have a regular electrical engineer on the staff in order to supervise the work on electrical equipment.

Then in a very concise manner, he told of some of the contributors of the General Electric Co. to industry, of their 47 factories in the United States, and of the key note of the whole organization, Service to Customer. In the Schenectady plant, he stated that 22,000 people were employed and about 2,000 of this number were in the general office. The plant covers approximately 700 acres, and consists of 360 buildings. Fifty carloads of finished products are shipped from the Schenectady plant each day. Such a shipment necessarily emphasizes the magnitude of the organization.

The afternoon was spent as the morning, in plant visitation. The plants visited, and in the order of visits were the Edison Lighting Institute of the General Electric Co., Harrison, N. J., Manhattan Rubber Mfg. Co., Passiac, N. J., and the Clifton Paper Mills, Clifton, N. J. Plans had been made to visit the Hammersley Mfg. Co. as well as the Hyatt Roller Bearing Co., but time prevented.

Edison Lighting Institute.

It would be impossible to describe accurately the many things which were seen at the Edison Lighting Institute. This visit proved to be a college education on the history of electrical illumination, and the application of electricity to all kinds of artificial illumination. The effects of direct, semi-direct, and indirect lighting were not only explained, but demonstrated. At the same time, the advantages of the proper quantity of light for best working conditions, together with the spacing of lights to obtain such conditions was demonstrated. A moving picture film was shown picturing in detail the many operations in the manufacture and testing of incandescent bulbs. To fully appreciate the importance of such a subject as artificial illumination, it would be well for any interested party to have the privilege of such a laboratory visit.

Manhattan Rubber Mfg. Co.

After the visit to the institute, the superintendents went to the plant of the Manhattan Rubber Mfg. Co. In this instance, opportunity was afforded to see the manufacture of rubber covered rolls, belting and other rubber goods commonly used in the industry. The operations in the manufacture of these various products were carefully explained from the compounding of the rubber to the preparation of the finished products for shipment. For example, in the roll covering department, the core of the roll was first grooved to permit proper adhesion of the rubber to the core circumference. Then the metal core was covered with rubber. This was done by winding the rubber in the form of thin sheets on the core in the same manner as the winding operation in the production of a roll of paper with the exception that in this operation it was necessary to do the work by hand. This base of rubber was then vulcanized and soft rubber built up in thin sheets again on its surface until the roll was of the necessary diameter. Such a roll was then wrapped in damp sheeting and vulcanized. After the curing of such a roll, it was ground or buffed to exact size. The use of the plastometer in testing the hardness of such a roll was likewise demonstrated.

In the belt department, it was possible to visit the mixing room where the rubber was compounded, the calendar room where the cotton duck was impregnated and covered with rubber, the belt making room where the calendered duck was cut to width and built up into belting, and the press room where the raw or unvulcanized belt was placed in tremendous steam heated presses and thus vulcanized under both heat and pressure. Surely some of the problems of the roll manufacturer are now more fully appreciated by those who had the privilege of visiting the plant of the Manhattan Rubber and Mfg. Co.

Clifton Paper Mills.

The last visitation of the day was to the plant of the Clifton Paper Mills where a new machine room including a new Downingtown cylinder machine operating on board was inspected. According to reports, the new machine has been in operation only a few weeks. The machine room was well lighted, well ventilated and clean. The cylinder machine with plenty of room on the drive side was functioning perfectly as was the Camachine slitter and rewinder at the dry end of the machine. The entire installation was one in which the mill as well as the manufacturers of the equipment can take much pride. Many details of the machine were observed by visiting superintendents.

Banquet in Newark Athletic Club.

Returning to the Athletic Club from the paper mill, it was only a few minutes before the banquet program of the evening was begun. The repast was excellent and during the banquet hour the guests were well entertained by five musicians as well as with song skits by "Deckle and Dandy", two clever songsters.

Chairman Ellis, at the close of the banquet, introduced Mr. John J. White of Holyoke, Mass., as toastmaster for the evening. Anyone knowing Mr. White well, knows how efficiently he handles such a position.

Vocational Education in Pulp and Paper Industry.

Mr. White introduced Mr. Harry E. Weston, The Paper Industry, Chicago, formerly Assistant Professor of Pulp and Paper Manufacture at the New York State College of Forestry, Syracuse, N. Y., as the first speaker of the evening. Mr. Weston's subject was "Vocational Education in the Pulp and Paper Industry". In his talk he told of the historical development of vocational education in the pulp and paper industry and briefly described the various institutions in the United States and Canada that are giving instructional work along these lines.

Mr. Weston opened his remarks with a number of questions dealing with the incentives which lead men to seek an education and the goal for which they strive. He referred to the movement in America to modify the educational systems, making them more practical to provide for the large army of industrial workers in this country the opportunity to be as skilled in his line of work as the scholar or gentleman of wealth.

Speaking of vocational training, Mr. Weston specifically dwelt upon its application to the pulp and paper industry, one of the leading industries of this country. He brought out the need of the industry for highly trained men; and that the chief impulse which leads a young man to seek to enter any industry is to make a good living. He may be interested in higher and more unselfish motives, but the consideration of a sufficient income is paramount. His view of life and ability to seek and enjoy things worth while, as well as his standing and usefulness in his community, is based largely upon his ability to live a normal life in comfortable surroundings.

The thought was brought out that the pulp and paper industry, offering as it does unlimited opportunity, considers vocational training an important issue. It needs scientifically trained men, and the different associations of the industry have, therefore, recognized the importance of this phase of the industrial problem and laid plans to study the situation.

Pulp and Paper Making Courses—Mention was made of educational institutions which have included pulp and paper making in their courses of instruction. The University of Maine and the New York State College of Forestry at Syracuse, are giving specialized work over a four-year course leading to a degree. The Massachusetts Division of University Extension has developed both extension and correspondence courses. The Ohio State University has done some work among the mills in the Miami Valley. The Institute of Industrial and Domestic Arts, Gardenvale, Quebec, is offering correspondence instruction to both lay students and to employees in the mills. The Three Rivers Technical and Paper Making School at Three Rivers, Quebec, has also provided a course for employees in mills as well as students. The most recent, and one of the most interesting, educational programs of this type to be undertaken by a state, is that of Wisconsin. In this instance, regular class work has been instituted in the schools of Green Bay, Appleton, and the Neenah and Menasha districts, under the supervision of Mr. H. G. Noyes. The work although still young, has proved to

successful that an assistant has been appointed to aid Mr. Noyes. In addition to this program, the Extension Division of the University of Wisconsin is offering extension and correspondence courses.

Instances were cited of some of the large mills which have created sufficient interest among their employees that they have been able to include classes of instruction in pulp and paper making as a part of their industrial educational program. One notable example was mentioned, that of the Champion Fibre Co., Canton, N. C., which gives such instruction under the direction of J. Norman Spawn and his co-workers.

In closing, the mechanical and scientific progress of this age was stressed, which brought out the advantages of a better understanding between schools and industries, that the educational systems of the country be modified all possible to make better, more highly-trained industrial workers.

Local Industrial Problems.

Following Mr. Weston's talk the toastmaster introduced Honorable J. Henry Harrison, who spoke interestingly on the industrial conditions in and around Newark, a section of country including New York City, a small portion of New York State, the State of New Jersey, and a portion of Pennsylvania. He told of the work of New Jersey in the building of good roads and explained how these arteries of transportation aided in the development of big business. He stated that the problem of drinking water supply was being studied carefully and described the excellent work of the state in educational matters. He explained that that section of the United States constituted one of the greatest industrial centers in the world. The talk was well received and many helpful facts about the locality were obtained.

A Clever Entertainer.

After the speech of Honorable J. Henry Harrison, the toastmaster introduced Sir Charles Bartholomew, Baronet, Director, British Papers, Ltd., who proved to be the real entertainer of the evening. He impersonated royalty in a very practical way, discussed accurately the economic situation in England, mentioned briefly the antics of Mayor Thompson of Chicago, told many clever sidelights on the Prince of Wales, and then described some of his various experiences since arriving in the United States. In fact, it was a rather unusual but interesting caricature of our everyday American life. Following his speech, he sang several songs and ballads by request. Holding the audience cleverly throughout the entire period, he was then introduced in his true role as Mr. Bartle B. Doyle of New York City.

Talks on Association Benefits.

Mr. Ben Larrabee, representing the national organization of the superintendents, followed Mr. Doyle's portion of the program with a few remarks. He congratulated the division on the successful meeting, discussed briefly the purpose of the association and showed how such conventions aided each superintendent in the handling of his work. "Share Your Knowledge" was the motto stressed by Mr. Larrabee.

Mr. L. D. Post, publisher of the Paper Mill, was introduced following Mr. Larrabee's remarks as the last speaker on the program. Mr. Post's main theme was developed around the thought of future superintendents' conventions. He told of the many meetings which he has attended, the types of programs presented, etc., and recommended that papers prepared by the superintendents for presentation at their regular meetings would aid in the dissemination of the right kind of information. He also suggested that papers be prepared by individuals outside the association on subjects of particular interest to the body of superintendents. In this way, it would be possible to reap the greatest benefit from the association. Mr. Post's remarks concluded the formal program of the day.

Registration.

Among those registered at the meeting were:

A. P. Atkinson, Wm. E. Hooper Sons, Philadelphia, Pa.
D. Baker, P. H. Gladfelter, Spring Grove, Pa.; Frank Ball, Manhattan Rubber Mfg. Co., Passaic, N. J.; F. L. Barstow, U. S. Rubber Co., Fitchburg, Mass.; Mr. and Mrs. E. Bechard, Eastwood Wire Mfg. Co., Belleville, N. J.; Ellis Barker, Downingtown Mfg. Co., Downingtown, Pa.; G. F. Begnal, Baker Mfg. Corp., Saratoga Springs, N. Y.
J. E. Collins, Bogota Paper Board Co., Bogota, N. J.; W. W. Cronkhite, General Electric Co., Philadelphia, Pa.; H. C. Couch, Consumers Box Board Paper Co., Lititz, Pa.; S. Clayman, National Aniline & Chemical Co., Philadelphia, Pa.; John Cornell, The Paper Mill, New York, N. J.; L. W. Crouse, Bennett, Ltd., Cambridge, Mass.
Mr. and Mrs. J. H. Dow, Eastwood Wire Mfg. Co., Belleville, N. J.; Guy H. Davies, Mt. Holly Paper Co., Mt. Holly Springs, Pa.; John Durken, Wilson Wire Works, Kearney, N. J.; J. C. Dieffendefer, Paper Makers Chemical Co., Easton, Pa.
Mr. and Mrs. Chas. L. Ellis, Downingtown Mfg. Co., Downingtown, Pa.; R. Eminger, Sec'y American P. P. Mill Supts. Ass'n, Miamisburg, O.; Jacob Edge, Downingtown Mfg. Co., Downingtown, Pa.; I. Ekholm, National Aniline & Chemical Co., New York, N. Y.
F. H. Fielding, Diamond Mill & Paper Co., Bloomfield, N. J.; Mr. and Mrs. Geo. Foreman, Schmidt & Ault Paper Co., York, Pa.; B. J. Fringelin, Diamond State Fibre Co., Bridgeport, Pa.
E. C. Gildenzop Congoleum Nairn Co., Asbestos, Md.
R. Roy Hosner, Scott Paper Co., Chester, Pa.; John J. Hughes, Hammersley Mfg. Co., Garfield, N. J.; C. R. Hunsicker, United Paper Board Co., Whippany, N. J.
J. H. Jewett, R. J. Dick Co., New York, N. Y.
Geo. D. Kliberry, Downingtown Mfg. Co., Downingtown, Pa.; J. A. Kilcommons, Kalbfleisch Corp., New York, N. Y.; L. E. Kauffman, The Paper Products Mfg. Co., Swarthmore, Pa.; C. J. Kern, Moore & White Co., Philadelphia, Pa.; T. J. Keenan, The Paper Industry, New York, N. Y.; L. Kessler, Manhattan Rubber Mfg. Co., Passaic, N. J.
A. W. Lunn, General Electric Co., Newark, N. J.; J. H. Loomis, Heller & Merz Co., New York, N. Y.; John J. Loob, Scott Paper Co., Chester, Pa.; J. D. Lawery, Kalbfleisch Corp., New York, N. Y.
Thos. F. Martin, Hammersley Mfg. Co., Garfield, N. J.; R. S. Murgatroyd, J. W. Bolton & Sons, Lawrence, Mass.; M. Craig Maxwell, MacDowell Paper Mills Co., Philadelphia, Pa.; R. A. Mitchell, R. J. Dick Co., New York, N. Y.; H. V. McInery, New York, N. Y.; H. E. Maul, Ravenswood Paper Mill Co., Long Island City, N. Y.
R. F. Nelson, Glassine Paper Co., West Conshohocken, Pa.
John H. O'Connell, Springfield, Mass.; J. Owens, Jr., Fibre Conduit Co., Orangeburg, N. Y.
J. L. Purvis, Tarentum Paper Co., Tarentum, Pa.; L. D. Post, The Paper Mill, New York, N. Y.; A. Pierson, Consumers Box Board Paper Co.; Lititz, Pa.
Wm. J. Robertson, Heller & Merz, New York, N. Y.
A. A. Standley, Downingtown Mfg. Co., Downingtown, Pa.
E. P. Thornton, W. E. Greene Corp., New York, N. Y.; A. A. Tanyane, Paper Trade Journal, New York, N. Y.
R. Van Cleef, Hammersley Mfg. Co., Garfield, N. J.
G. D. Wyatt, The Paper Industry, New York, N. Y.; John J. White, Holyoke, Mass.; C. H. Wadsworth, C. H. Wadsworth Co., New York, N. Y.; H. E. Weston, The Paper Industry, Chicago, Ill.; J. B. White, National Vulcanized Fibre Co., Yorklynn, Del.; A. E. Waugh, U. S. Rubber Co., Philadelphia, Pa.; S. C. Wentz, P. H. Glatfelter Co., Spring Grove, Pa.; B. Weston, Mt. Holly Paper Co., Mt. Holly Springs, Pa.; G. E. Winslow, General Electric Co., Philadelphia, Pa.
G. A. Zeiss, Jr., Manhattan Rubber Mfg. Co., Philadelphia, Pa.

First Commercial Forestry Conference

D. C. Everest, M. E. Marcuse, A. C. Goodyear and Hugh P. Baker represent the paper industry on the general committee which is organizing the first annual Commercial Forestry Conference under the direction of the Chamber of Commerce of the United States.

This conference will be held at the Congress Hotel in Chicago, November 16 and 17, and includes a discussion of the following subjects: Pioneering in Forestry, Forest Fire Protection, Forest Fire Insurance, Forest Taxation, Possibilities of Commercial Forestry and Forest Research.

"Practicing Forestry Despite Handicaps," is the subject of a paper which will be presented by Col. A. C. Goodyear, of the Bogalusa Paper Co.; "Natural Reforestation for Pulpwood," will be covered by George N. Ostrander of Finch, Pruyn & Co.; "Progress, Possibilities and Needs in Forest Fire Protection by Regions" is the subject of Forrest H. Colby, of the S. D. Warren Co.; R. B. Robertson of the Champion Fibre Co. will speak on "How Are We to Obtain Fast Growth of the Right Kind of Timber?" while D. C. Everest, president of the American Paper and Pulp Ass'n will cover "Government and Industrial Forest Research."

The first national Commercial Forestry Conference should be extremely interesting, particularly to the paper industry which is dependent to a large extent upon the products of the forest for its basic raw material.

In describing the exhibit of the Bakelite Corporation at the Eleventh Exposition of the Chemical Industries, on page 1132 of the October issue of The Paper Industry, reference was made to an application of bakelite on the machine dryer hood designed by H. S. Taylor. The reference was worded "Howard S. Taylor, formerly of Dayton, Ohio, and now of Montreal," which conveyed an erroneous impression, as H. S. Taylor now has offices in both Dayton, Ohio, and Montreal, Quebec, work in the United States being handled through Dayton, and Canadian work through the Montreal office.

New High-Pressure Power Plant of the Chesapeake Corporation

Productive Capacity Increased and Great Savings Effected by the Reconstruction of the Plant

IN VIRGINIA, forty miles due east from Richmond, at a point where the Mattaponi and Pamunkey rivers unite to form the headwaters of the York River, lies West Point, a town with a population of between 1,650 and 1,700. The York River flows southeast into the Chesapeake Bay and the Atlantic Ocean, so there are good steamboat connections with Norfolk and seaboard ports, while a branch of the Southern Railroad carries both freight and passengers from West Point to Richmond and other distributing centers.

For a period of nearly fifteen years The Chesapeake Corporation has operated a kraft pulp and paper mill at West Point. Originally, the sulphate mill, equipped with four digesters, three wet machines and one dry machine, turned out from 45 to 50 tons a day of kraft pulp; and the paper and board mill, with six beaters and a 5-cylinder Black-Clawson machine, made an average of 30 tons of product, distributed among container board, plain chip board, kraft paper dry and waterfinished, and heavy wrapping specialties.

This production had been increased year by year until 1925 when the capacity of the mill averaged 70 tons of pulp specialties and 40 tons of paper and board daily. More production was desired, but a further increase was barred by the limited capacity of the power plant in use. In consequence of this it was decided to make a complete change of boiler and power plant equipment by the installation of a high-pressure boiler and turbine, the idea being that such a change, with other improvements, would make for increased production at a reduced cost. Cheap electric power would be obtained for the operation of machinery, and an adequate supply of process steam provided for the operations of cooking puip, drying paper, etc.

Under the direction of R. S. Bayntun, formerly chief engineer of the mill and now of the Rust Engineering Company, Pittsburgh, designs were prepared which provided for a complete scrapping of the old equipment, boilers and all. A new boiler plant building of steel frame and hollow-tile construction, with stucco cover from the firing floor up, was erected, the firing floor of which rises 12 ft. above the ground level, thus permitting the basement to be used for ash hoppers, where ashes formed during the night can remain till next day, to be removed by two men who handle all the coal and ashes from both the day and night shift. In this way two men can do the work which required nine men under the old system. Certain other remarkable savings in operating costs have been effected, mill production being increased, coincidentally with a decrease in operating expenses.

Savings Effected and Comparative Figures

In a statement of savings effected by the new installation, Mr. Bayntun put the yearly total of such at $136,000, which he avers is calculated to pay off the whole cost of the improvements in less than three years. The following account of savings and comparative figures as submitted by him are based on a standard of 150 tons of product a day, both for the old plant and the new, it being thus assumed that the old plant would have been extended on the same lines to enable it to cope with such an output.

The guaranteed combined efficiency of the boilers, superheaters and air preheaters, with the stokers as installed, is 85 per cent. Mr. Bayntun has conservatively assumed as a basis of calculation a 24-hour efficiency for normal running of only 78 per cent. At the same time an efficiency figure of 67 per cent for the old conditions is not on the low side, and he believes that the net estimated improvement of from

Exterior view of new power plant of Chesapeake Corporation, West Point, Va.

67 to 78 per cent in substituting modern equipment for an out-of-date and overworked plant will probably be exceeded.

Proceeding on the foregoing lines, the daily coal consumption would be 68 tons and, allowing 32 tons for week-end running and losses, the weekly coal used would be 444 tons, the annual cost of which would be $108,000. Similarly, for equal production, the old plant would annually consume coal to the value of $200,000, so the saving on this item would amount to $92,000 per annum. A further saving of $11,000 per annum will be effected, it is estimated, by burning a cheaper grade of fuel, as the old plant required coal of the highest possible quality at a correspondingly high price.

Repair costs for the old boiler and stoker plant were excessive, and a moderate estimate has been made of saving 60 per cent of the expenditure on these items, reducing it from $30,000 to $12,000 per annum—a saving of $18,000.

The staff for the old plant has been reduced by 14 men—firemen, ash rollers and coal passers—with a net savings of $20,000 per annum.

The cost of material, depreciation, and burden have been taken as remaining unchanged.

Figuring along these lines and on a basis of 46,800 tons annual output, the power cost for the new plant is estimated at $163,500; whereas for the old plant extended on existing lines, it would be $300,000, a net saving of $136,500 per annum.

The estimated cost of extending the old plant to cope with the desired increase of output was $80,000. The new plant has cost well under $350,000, so that the whole capital will be returned in less than three years.

The following figures afford some comparisons:

POWER COST PER TON OF PRODUCT

	Dollars
Old plant, 1920	13.21
Old plant rearranged, 1925	6.95
New plant, estimated	4.05

COAL PER TON OF PULP

	Pounds
1920	2110
1925	1360
New plant	734

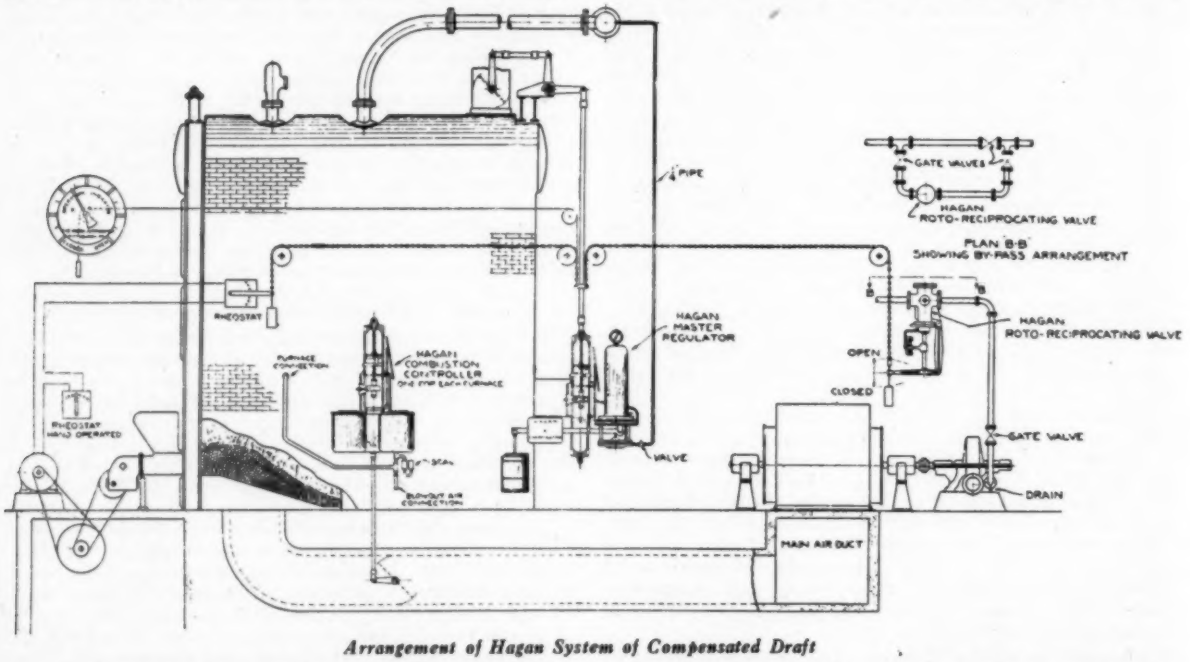
COST OF ELECTRIC POWER, OLD PLANT

	Cents per kilowatt-hour
1920	1.0
1925	1.11
New plant	0.19

Description of New Plant

The scheme of reconstruction as explained by Mr. Bayntun, who accompanied the representative of THE PAPER INDUSTRY in a recent tour of the plant, Elis Olsson, general manager of the mill, being one of the party, was to employ a turbine with high back pressure, taking all the steam generated by the high pressure boilers and exhausting into the medium-pressure steam header at the minimum necessary pressure; the operation to be paralleled on the electrical side with a medium-pressure turbine supplied from the high-pressure exhaust.

The new system is atuomatically self-balancing for all ordinary variations either in the demand for medium or low-pressure steam or electrical power, the load shifting from one turbine to the other as required. Thus, supposing there is an increase in the demand for medium-pressure steam with the electrical load remaining constant, the pressure in the 130-lb. line drops and the governor of the high-pressure turbine opens up to admit more high-pressure steam. This results in an increased load being taken by this set, which in turn relieves the low-pressure turbine of a portion of its load to set free the 130-lb. steam it was previously taking to assist in supplying the increased demand. Correspondingly, any alteration in the electrical load is automatically cared for. Only very unusual conditions, it is said, will have to be met by hand control or the use of steam through reducing valves.



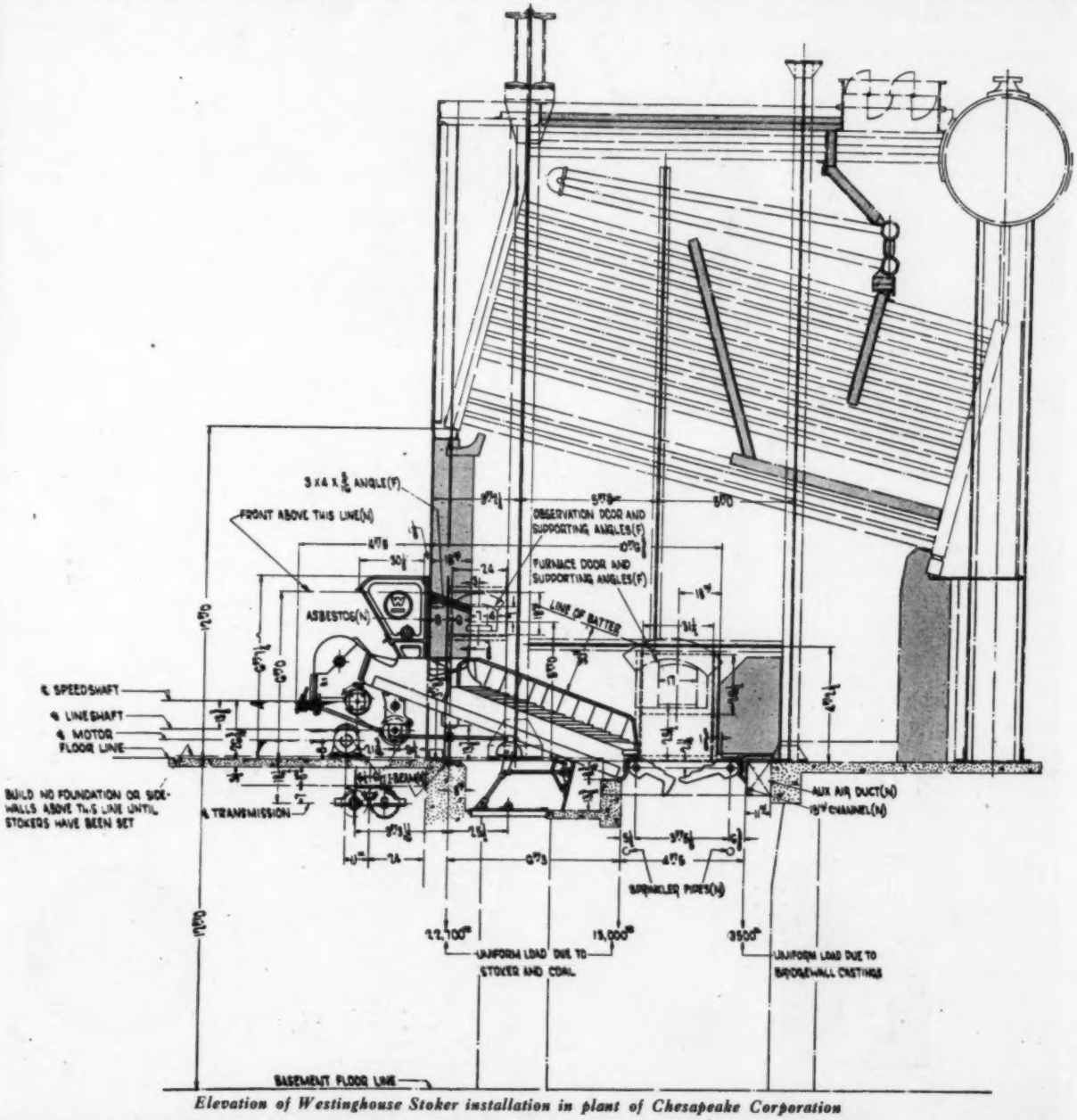
Arrangement of Hagan System of Compensated Draft

In order to provide for exceptional conditions, when the supply of 130-pound steam from the high-pressure turbine, owing to a temporary falling off in the demand for electrical power, or an abnormal demand for low-pressure steam, should be insufficient, a complete reducing-valve system in duplicate, with a desuperheater, has been installed. The system includes an eight-inch "Arca" reducing-valve, for normal operation, with double shut-off and an intermediate drain on both inlet and outlet to permit of overhaul while steam is in the line, in spite of possible leaky valves. This is supplemented by a six-inch Fisher reducing-valve for stand-by, with single shut-off. On the outlet, a manifold with four safety-valves is installed to protect the medium-pressure line, and from that the steam is led through a 14-inch Elliott surface-type desuperheater, water for which is provided by a Gould pump having a capacity of 12 gallons a minute, with automatic start and stop.

Evaporator System for Feed Water

The turbine room has at present two turbines installed.

The one high-pressure unit is a 1500-kilowatt Westinghouse high-back-pressure turbine, taking steam at 420 pounds and 100 degrees superheat, and exhausting at 130 pounds to the medium-pressure steam header. This is coupled to a 550-volt, three-phase, 60-cycle generator, running at a speed of 3600 r.p.m. At full load, the water rate is 60 pounds per kilowatt-hour, and at 1000 kilowatts is 61 pounds. The other turbine set is a medium-pressure bleeder and condensing set of 750-kilowatt capacity taking steam at 130 pounds and 50 degrees superheat, with a water rate condensing of 17 pounds per kilowatt-hour. It has been specially designed for maximum efficiency as a bleeder unit, as it is not expected to reject more than a very small proportion of the steam to the condenser. The conditions of parallel running of these sets are mentioned above.



Elevation of Westinghouse Stoker installation in plant of Chesapeake Corporation

Evaporator System for Feed Water

In regard to the general design of the boiler plant, Mr. Bayntun said that with high-pressure boilers it was necessary to provide perfect feed-water. The make-up water at West Point is obtained from artesian wells and is excessively alkaline, containing from eighteen to twenty-one grains of equivalent sodium bicarbonate to the gallon. The only reliable method of getting perfectly pure water for the boilers was by the employment of evaporators for the whole of the make-up, and this raised the question of economy. After much cogitation, a three-effect evaporator system was installed to take steam from the 130-lb. line and condense the vapors from the third effect with the boiler feed water so as to carry them back to the boilers and also permit about 160 kilowatts of electrical power to be extracted from the steam on its passage through the high-pressure turbines. The equipment furnished by the Griscom-Russell Company, of New York, for providing distilled boiler feed make-up water to the feed system is enumerated in the tabulated list of equipment at the end of this article. The operation of the system is comparatively simple and does not rely upon any chemicals, though as an emergency supply, acid-treated

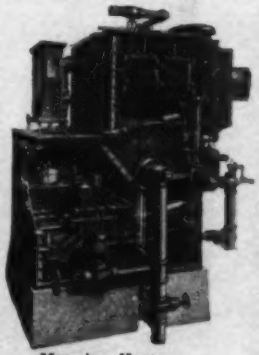
THE COCHRANE PRODUCTS:

Open Feed Water Heaters; Closed Heaters; Deaerating Heaters; Metering Heaters; Hot Process Water Softeners; Cold Process Softeners; Pressure Filters; Steam and Oil Separators; Back Pressure Valves; Drainers or Traps; Flow Meters for Steam or Water in Pipes; V-Notch Meters; Weighing Meters.

Slogan: *"To Economize, Cochranize."*

COCHRANE OPEN FEED WATER HEATERS:

The Cochrane heater heats the water to steam temperature and serves as a hot well or return tank and as an automatic cold water regulator. Cochrane Metering Heaters embody a V-notch meter for accurate measurement of the total boiler feed.



Metering Heater

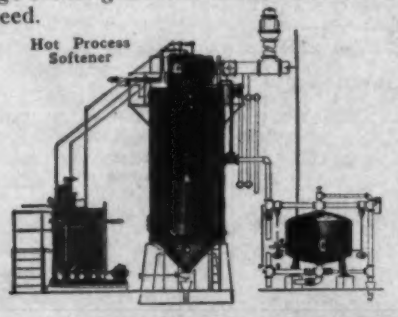
COCHRANE DEAERATING HEATERS:

These heaters expel oxygen and other gases from water and thereby prevent corrosion in piping, economizers and boilers.

Deaerating Heater

COCHRANE HOT PROCESS WATER SOFTENERS:

In these water softeners the water is heated to 210° F. before the chemical reagents are added. The chemical reactions are much more rapid and complete in hot water than in cold water and the precipitates settle more rapidly. Complete protection to the boilers against corrosion and scale and the minimum amount of sludge-forming matter in the treated water are guaranteed.

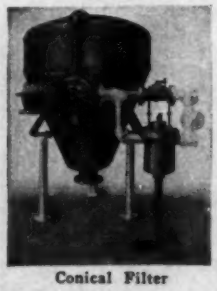


Hot Process Softener

COCHRANE CLOSED HEATERS:

Have been designed with particular care to secure high heat transmission, to facilitate inspection and cleaning and to eliminate expansion and contraction strains.

Closed Heater, Storage Type



Conical Filter

COCHRANE STRAINERLESS CONICAL FILTERS:

A new, improved design for clarifying water for washing pulp, boiler feeding, etc. Single control valve and rate of flow controller make operation simple and certain.

COCHRANE MULTIPORT BACK PRESSURE VALVES:

These valves differ from the ordinary back pressure valves in that a number of small disks are used instead of one large disk, thus reducing the size, weight and travel of the disks, and insuring absolute safety.

Multiport Back Pressure Valve

Steam or Oil Separator

Low Pressure Trap or Drainer

COCHRANE TRAPS AND DRAINERS:

Remove condensate or drips from low or high pressure heating or drying coils, radiators, jackets, steam and oil separators, etc. The Cochrane multiport drainer has extraordinary discharge capacity.

COCHRANE FLOW METERS:

These meters are simple, reliable and accurate devices for indicating, recording and integrating flow of water, steam or air in pipes. The chart divisions are uniform. Combined pressure and temperature recording pens can be included.

Integrating Flow Meter with Recording Thermometer

COCHRANE CORPORATION

3124 North 17th Street, Philadelphia, Pa.

BRANCH OFFICES

Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Denver, Colo.
Detroit, Mich.
El Paso, Tex.
Hazleton, Pa.
Houston, Tex.
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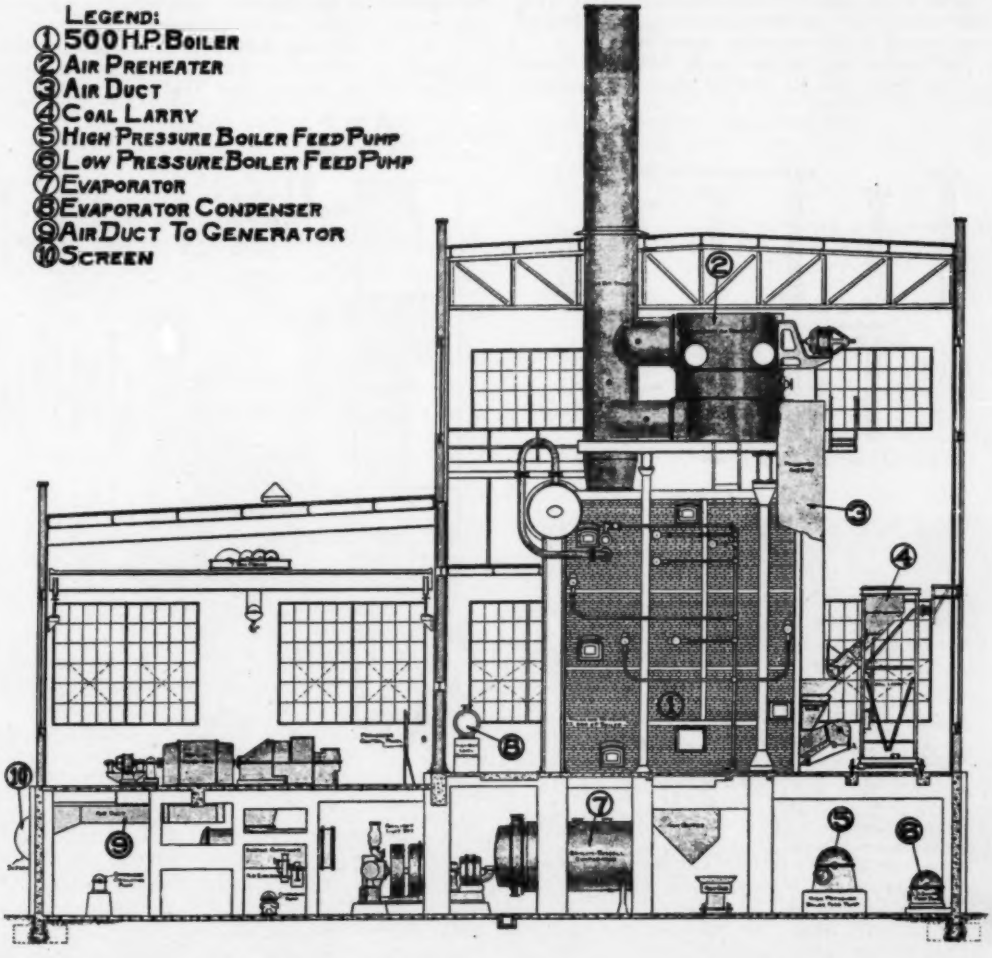
Little Rock, Ark.
Los Angeles, Cal.
Memphis, Tenn.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Pittsburgh, Pa.
Portland, Ore.
Richmond, Va.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah
San Antonio, Tex.
San Francisco, Cal.
Seattle, Wash.
Syracuse, N. Y.
Phoenix, Ariz.
Tulsa, Okla.
Calgary, Alta.
Toronto, Ont.
Montreal, Que.
Ottawa, Ont.
Halifax, N. S.
Vancouver,
Winnipeg, Man.
Havana
Paris

ENGLAND: Norman Engineering Co., 23 Budge Row, London

water may be fed to the boilers by means of a Cochrane water treating unit, as furnished by the Cochrane Corporation, Philadelphia.

The old boiler equipment consisted of five 300 h. p. and one 400 h. p., stoker-fired Wickes boilers; one 300 h. p. hand-fired B. & W. boiler, and a 150 h. p. horizontal return tubular boiler for refuse disposal. The new boilers that replaced them were three 494 h. p. Walsh & Weidner boilers operating at 425-lb. steam pressure, with Foster superheaters. The installation includes Westinghouse 5-retort, 18-tuyer, under-



feed stokers, designed to burn coal of 13,750 B. t. u. and 10 per cent ash, and permitting of 300 per cent rating on the boilers, though it is not intended to operate at over 200 per cent. An elevation of the stoker installation is shown in the accompanying illustration.

A suitable draft over the fires is maintained by the Hagan system of compensated draft. This regulates the fan speed according to steam pressure; it is controlled by regulating devices, the arrangement of which is indicated in the outline sketch reproduced herewith. The Hagan Corporation also supplied steam purifiers for removing moisture before the steam is delivered from the boiler drums.

Air preheaters of the Ljungstrom rotary pattern, capable of supplying air for the boilers at a temperature of 450°, while passing gases to the stack at 260°, are an important feature of the installation. The air preheaters are installed on the top of the boilers instead of being in the more usual position at the back, and the whole of the top of the boiler room—which is distinct from, and higher than, the turbine room—forms a closed box, so to speak, whence the fans draw their air. The consumption of air is such that at normal loads the whole of the air in the boiler room is drawn through the fans in five minutes, and thus there is a continuous and ample circulation of air from the turbine room, taking the hot air discharged from the generators to the lower parts of the boiler room, thence up to and though the preheaters, carrying with it the hot air from the boiler settings, and effecting a marked regenerative action, with corresponding economy. The possibility of recovering most of the heat lost by conduction and radiation from the settings has been taken advantage of by the use of hollow, ventilated, side walls; this should, by its cooling effect on the furnace linings, improve the life of the refractories.

Construction changes on the Ljungstrom equipment accounted for mill operations being suspended at the time the plant was visited. It was found necessary, for instance, to provide more fan horsepower to force the preheated air under the stokers and at the same time suck out the hot flue gases, for in actual operation it developed that with preheated air, a higher air pressure was required in the stoker wind box, particularly at the new high ratings; this was provided by strengthening the driving gear and adding a second stage to the original air fans, two fans being now driven in series.

Owing to the location of the preheaters on top of the boilers, some difficulty was experienced in assuring careful attention to the oiling system of the fans and rotary gratings. To reach the preheaters, the stokers had to mount a narrow ladder in a confined space. A change was being made here so that the side feed oilers could be replaced by oil tanks. Having a reserve capacity of oil, these tanks will require to be filled only once a week, instead of twice a day as formerly. A clear picture of the design of the power plant may be

obtained from the accompanying sectional side elevation which shows the Ljungstrom air preheater (2) situated alongside the lower part of the stack immediately above the 500-h. p. boiler (1).

Diamond automatic valved soot blower units of 1½" bore, which take steam from the 130-lb. line after this steam has already done work in the high-pressure turbine, form part of the equipment, seven being attached to each boiler; five of these are of calorized and two of untreated steel.

Bailey boiler meters, temperature recorders and multi-pointer gauges are fitted to each boiler, and a check is afforded by a Brown boiler front type CO_2 electrical indicator with illuminated dial which can be switched on to any boiler; flow meters are placed in the principal steam lines.

The boiler feed pumps are by the A. S. Cameron Steam Pump Works, New York, two No. 3 HST six-stage Cameron centrifugals being used. These are intended to handle a capacity of 240 gallons a minute, against a head of 1,150 ft. at 1,700 r.p.m., with water at a temperature of 212°. A single-stage Cameron centrifugal pump is also used in connection with a Westinghouse condenser. The feed pumps are arranged for dual drive, normally by electric motor, the work being automatically taken over, in the event of any failure, by a Westinghouse steam-turbine supplied from the 130-lb. line.

Copes tension-type, feed-water regulators, with pump governors are installed, and the feed range is run in a modified ring system, for security of supply.

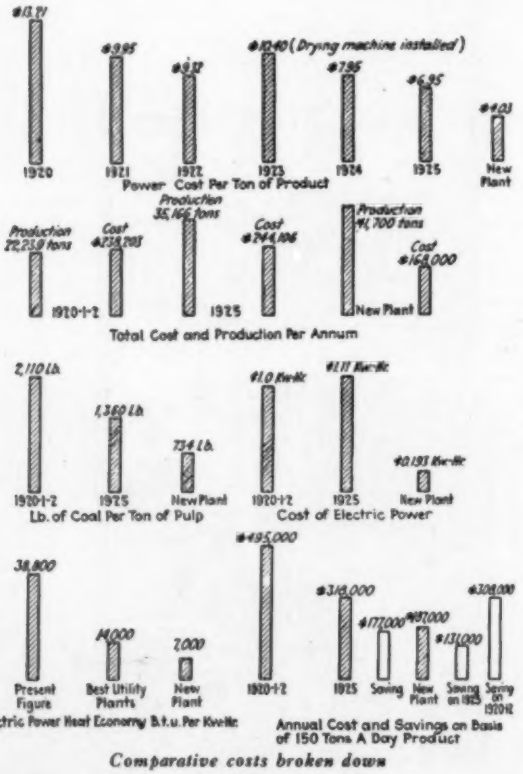
The steam piping, supplied and erected by the Pittsburgh Piping and Equipment Company, consists of leads from the three boilers to a main 8-inch header, and thence to the turbine, with a connection through a reducing valve to the steam piping system. The piping is made in accord with the American 400-lb. standard, with fittings and flanges of cast steel and joints of patented Sargol type. The boiler feed piping corresponds to American 600-lb standard, with extra strong piping, flange joints of the Van Stone type and chrome steel studs of a tensile strength of 100,000 lbs.

The evaporator piping system for steam and water was supplied and erected by the Grinnell Company, of Providence, R. I., and the remainder of the piping by the construction staff of the mill.

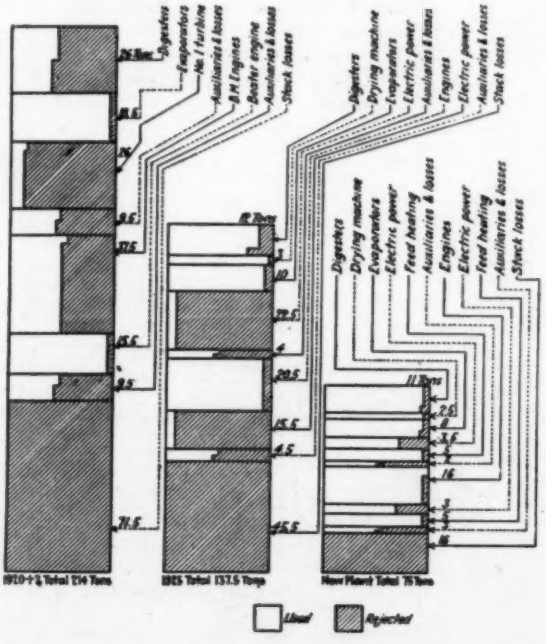
The R. H. Beaumont Company supplied the coal and ash handling equipment, consisting of a track hopper and automatic feeder leading to a double roll crusher, and the chain conveyor which takes the coal up to a 150-ton circular steel-plate bunker placed outside the boiler house. A traveling weigh larry is used to convey the coal to the boilers. Ground storage is used to provide a supplementary supply of coal.

Water storage is provided by three 18,000-gallon circular tanks, placed on an elevated concrete structure adjacent to the coal-bunker, and these are used respectively for condensate, acid-treated water, and raw water.

It is generally agreed by those competent to judge the comparative values of low-pressure and high-pressure industrial power plants that the plan worked out by Mr. Bayntun for the modernization of the old plant at The Chesapeake Corporation's mill was the one best calculated to provide greatest economy of operation together with room for expansion and possible increased future production.



Comparative costs broken down



Distribution of heat and coal required for producing 150 *tons of product* (50 *tons dry pulp*, 50 *tons board*, 50 *tons wet pulp*) *under* (*a*) *original conditions*, (*b*) 1925 *conditions*, (*c*) *with new plant*

Conditions Inviting High Pressure Plants

The whole question of using high steam pressure in industrial power plants like pulp and paper mills is receiving a greater amount of attention at the present time than ever before. This is because there is a greater disposition on the part of paper and pulp mill executives to study power costs and take advantage of the means of obtaining cheap power offered by the installation of a high-pressure boiler and turbine plant. As pointed out by W. W. Spratt, general engineer of the Westinghouse Electric & Manufactuirng Company, in a recent discussion of the subject, paper mills are large users of process steam, requiring three to five pounds of steam for every pound of paper dried, and larger quantities of steam for cooking of pulp, etc. The average size mill will take from 75,000 to 100,000 lbs. of steam an hour; and the steam demand of the larger mill may range from 150,000 to 500,000 lbs. of steam an hour, thus indicating the importance of modern boiler plants. By the use of moderately high boiler pressures, such as 300 to 425 lbs., practically all

of the necessary power can be obtained as by-product power between the boiler pressure and the necessary process pressure.

In any consideration of changes in boiler plant equipment, each plant should be studied as an individual problem, and in planning a new design, sufficient flexibility should be provided to permit of expansion to meet possible future mill extensions.

The general equipment of The Chesapeake Corporation's power plant is tabulated herewith for convenience of reference.

General Equipment of Chesapeake Corporation's Power Plant

Generating Units:

1—500 kw. turbo generator including:
- 1—30 ENC turbine rated 1500 kw., 3600 r.p.m.
- 1—1500 kw., 1875 kv. a. at 80% p.f., 3 phase, 60 cycles, 600 volts, 3600 r.p.m., a. c. generator.
- 1—18 kw., 125 volts d. c. direct connected exciter.
- 1—1250 sq. ft. surface type condenser with the necessary 2 h. p. pump motor—Westinghouse Electric & Manufacturing Co.

1—750 kw. turbo generator including:
- 1—16 AB, 750 kw., 3600 r.p.m. turbine.
- 1—750 kw., 940 kv. a. at 80% p.f., 3 phase, 60 cycles, 600 volts, 3600 r.p.m. a. c. generator.
- 1—15 kw., 125 volts d. c., 3600 r.p.m., direct connected exciter.
- 1—BC air ejector
- 1—Jet type intermediate condenser—Westinghouse Electric & Manufacturing Co.

1—Eleven-panel control board—Westinghouse Electric & Manufacturing Co.

Boiler Equipment:

Three 494-h. p. Walsh & Weidner, seamless forged steel, sectional header, cross drum water tube boilers, built for 450 lbs. steam pressure and operating at 425 lbs. pressure. The boilers designed for 300 per cent rating are operating continually at 200 per cent rating. They are equipped with Foster superheaters, Westinghouse five retort stokers, Ljungstrom rotary type air preheaters. The boilers and auxiliary equipped are designed for a combined efficiency of 85 per cent. These boilers are built with inclined headers.

Hagan system of draft control consisting of—
- 1—Hagan master regulator.
- 1—Roto-reciprocating valve for each steam driven fan.
- 1—Roto-reciprocating valve for each steam driven stoker engine.
- 1—Combustion controller for each furnace.
- 1—Operation indicator.

Centrifugal steam purifier — Hagan Corporation, Pittsburgh, Pa.

Alkaline water treatment unit—Cochrane Corporation, Philadelphia, Pa.

3—2½-inch Type "R" Copes feed water regulators—Northern Equipment Company, Erie, Pa.

4—3-inch Copes pump governors—Northern Equipment Company, Erie, Pa.

Ljungstrom air preheater—The Air Preheater Corporation, New York.

Arca pressure reducing regulator—Arca Regulators, Inc., New York.

Arca temperature control—Arca Regulators, Inc., New York.

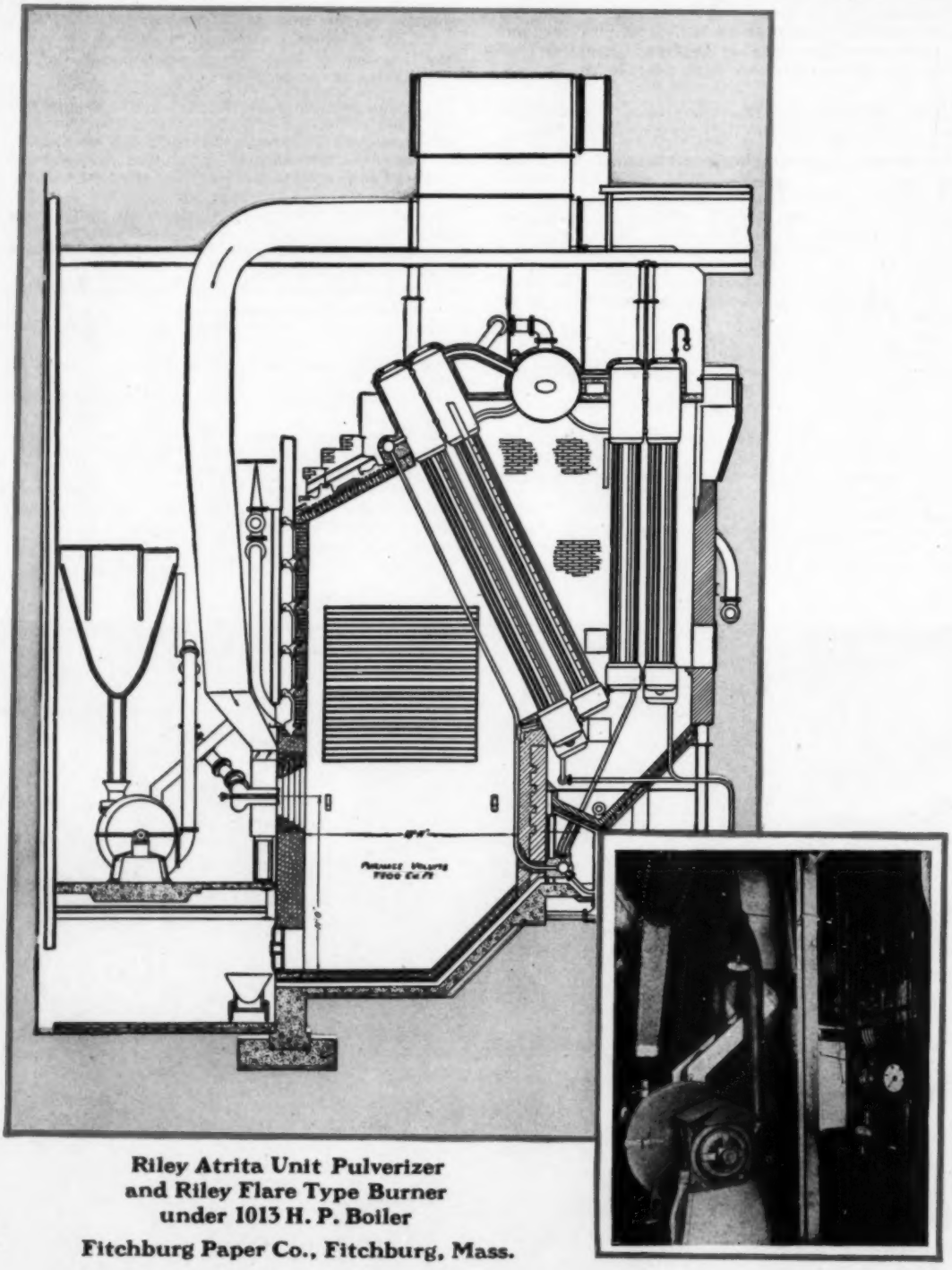
Boiler meters:
- 3—Bailey boiler meters, Type D26 Class 5.
- 3—Bailey temperature recorders Type K5 Class 55.
- 3—Bailey multi-pointer gages, Type P3—Bailey Meter Company, Cleveland, Ohio.

Brown boiler front CO_2 indicator—The Brown Instrument Company, Philadelphia, Pa.

Boiler feed pumps:
- 2—No. 3 HST six-stage Cameron centrifugal.

Turbine room of Chesapeake Corporation

An Excellent Pulverized Coal Installation



Riley Atrita Unit Pulverizer
and Riley Flare Type Burner
under 1013 H. P. Boiler

Fitchburg Paper Co., Fitchburg, Mass.

Riley Stoker Corporation

RILEY STOKER CORPORATION
9 Neponset Street, WORCESTER, MASS., U. S. A.

"RILEY" Underfeed Stokers
"JONES" Underfeed Stokers
"HARRINGTON" Traveling Grate Stokers
"MURPHY" Automatic Furnaces
Pulverized Coal Installations

BOSTON NEW YORK PHILADELPHIA PITTSBURGH BUFFALO CLEVELAND DETROIT SEATTLE
CINCINNATI CHICAGO ST. PAUL KANSAS CITY DENVER CHARLOTTE DALLAS HOUSTON NEW ORLEANS

Riley Engineering and Supply Co., Ltd., Toronto
Riley Stoker Co., Ltd., London

Boiler Equipment (Continued):

1—No. 2 LV single-stage Cameron centrifugal.

1—12 X 10 type ER-1 Ingersoll-Rand air compressor—A. S. Cameron Steam Pump Works, New York.

Soot blowers:

7—1½" Diamond automatic valved soot blower—Diamond Power Specialty Corporation, Detroit.

1—14", 250 lb. pressure standard desuperheater—Elliott Company, Jeannette, Pa.

Liquid level controllers:

2—1½" Fisher type 227A liquid level controllers.

4—2" Fisher balanced lever valves—The Fisher Governor Co., Marshalltown, Iowa.

Evaporators:

3—No. 7-K-126 G-R horizontal submerged type evaporators, sectional headers, scale-shedding design. One evaporator per effect.

1—No. 7-K-126 G-R horizontal, Bentube preheater for preheating and degassing the raw water fed to the shells of the evaporators.

1—No. 21-117 G-R style 'E' horizontal, four-pass evaporator condenser.

1—No. 21-106 four-pass style 'E' heater.

1—15" drainer for operation with the heater—The Griscom-Russell Company, New York.

Coal and ash handling equipment—R. H. Beaumont Company, Philadelphia.

Piping System:

Leads from three boilers to a main 8-inch header, thence to a 1500 kw. turbine, pipe joints of patented Sargol type.

Boiler feed piping, fittings and flanges of steel, with flange joints of Van Stone type—Pittsburgh Piping and Equipment Company, Pittsburgh, Pa.

The Fitchburg Paper Company Boiler Plant

By SAMUEL M. GREEN
Consulting Engineer, Springfield, Mass.

THE Fitchburg Paper Company operates four paper mills on the Nashua River in the city of Fitchburg, Mass., designated as No. 1, No. 2, No. 3 and No. 4 Mills. Their general location is shown by Fig. 1.

Samuel M. Green Company, consulting engineers, of Springfield, Mass., was engaged in 1926 to report on the power and steam generating equipment of the mills and to make recommendations for immediate and future improvements.

Steam was supplied to the mills from three boiler rooms: one at No. 1 and No. 2 with three 150 h. p., h. r. t. boilers; one at No. 3 with four 150 h. p., h. r. t.; and one at No. 4 with nine 167 h. p., h. r. t. boilers. All boilers were hand fired with the exception of three at No. 4 Mill which used pulverized coal.

The boiler feed water charts indicated an averaged hourly use of 17,000 lbs. at No. 1 and No. 2, 24,000 lbs. at No. 3 and 45,000 lbs. at No. 4 Mill.

Power was obtained from reciprocating engines at each mill, and from a 750 KW. bleeder type steam turbine at No. 4 Mill, and an average of about 880 KW. was purchased from the Fitchburg Gas & Electric Light Company.

Three of the boilers at No. 4 Mill required resetting immediately. Mr. Wright, the plant engineer, believed that it would be unwise to reset the old boilers, and in his opinion whatever was done should be of such character as to finally make the No. 4 boiler room a central boiler plant for all the mills. It was evident that such a plant would result in greatly reducing the costs of labor and fuel, and it was decided to carry out such a plan if possible.

The total average hourly steam requirements of all the mills as the plant was operating was 86,000 lbs. The purchased current will in the future be generated by a bleeder type turbine, and when this is done there will be 15,000 to 20,000 lbs. more steam required. The total steam required by all the mills and for generating current now purchased will, therefore, be about 106,000 lbs. per hour, equivalent to about 3100 boiler horsepower.

A plan and section of the No. 4 boiler room as it was is shown by Fig. 2, and it will be seen that it is surrounded on three sides by turbine room, paper machine room and finishing room, and on the fourth side by coal storage and railroad track. Therefore, a central boiler plant at No. 4 Mill had to be installed within this area.

Coal for the plant was delivered from a railroad trestle into a hopper and from this hopper by a skip hoist into a 70 ton bunker. Coal storage is also provided under the railroad trestle and is reclaimed from this storage by a Beaumont drag scraper. Coal was delivered from the 70 ton bunker to the front of the boilers by an electrically operated weighing larry.

The size and type of the new boilers were determined from the total steam required and the space available for their installation.

The completed central plant will have three 1000 h. p. boilers, two of them to operate at about 160 per cent rating, and the third to be held as a spare.

The Fitchburg Paper Company was not prepared to carry out the complete plan at once and instructed the engineers to install one of the three new boilers in the space occupied by the h. r. t. boilers which needed resetting, the boiler to be equipped to produce steam as economically as possible; also to install a steam line between No. 4 and No. 1 Mill boiler room so that the steam required by No. 1 and No. 2 Mills would be supplied from the new boiler.

A plan and section of No. 4 boiler room as it now appears is shown by Fig. 3. The section shows the new boiler and equipment.

The boiler plant at No. 1 Mill will be kept in operative condition so that if it becomes necessary to shut down the new boiler the mills can be operated by using the No. 1 boiler plant and the six h. r. t. boilers remaining in No. 4 boiler room.

The roof of the No. 4 boiler room was raised to provide ample head room for the new boiler and its equipment.

The exterior of the revised boiler room is shown by Fig 4.

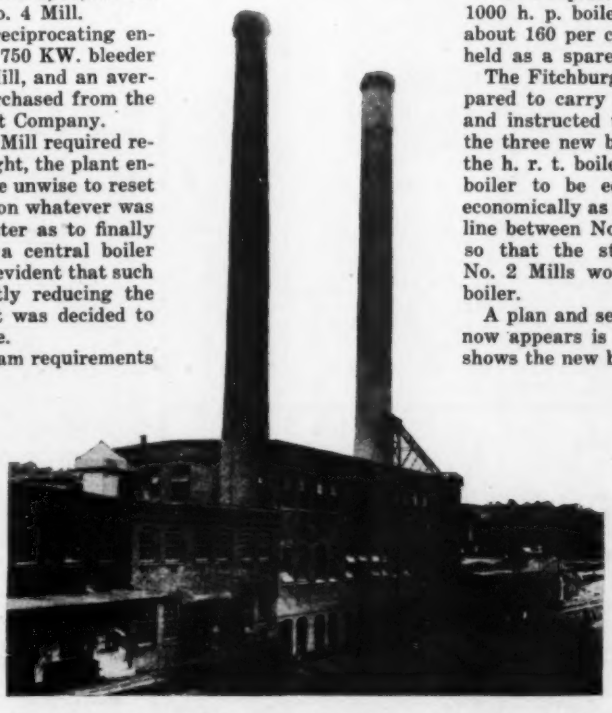


Fig. 4—Exterior view of Fitchburg Paper Company's new boiler plant at Fitchburg, Mass.

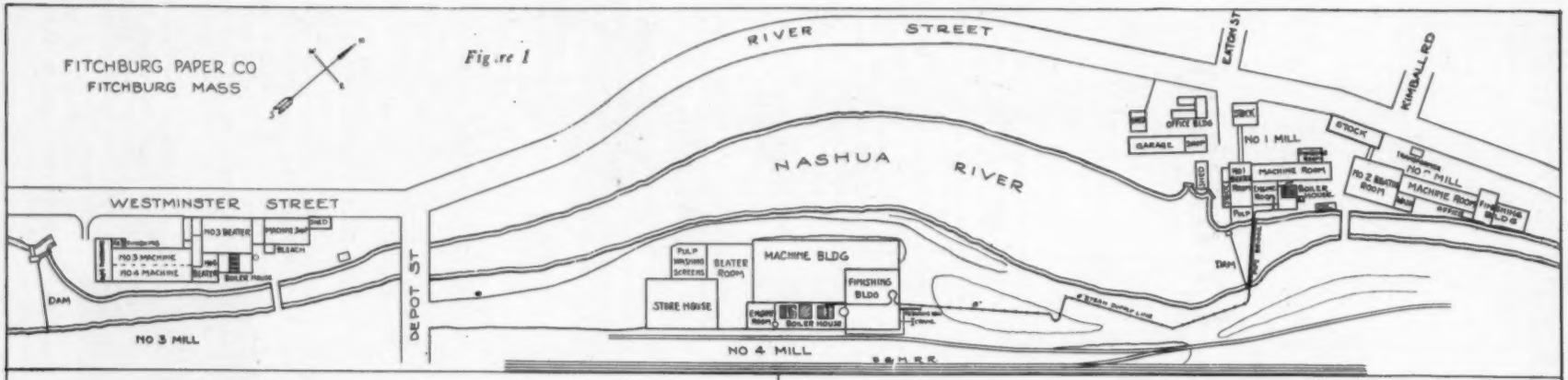


Figure 1

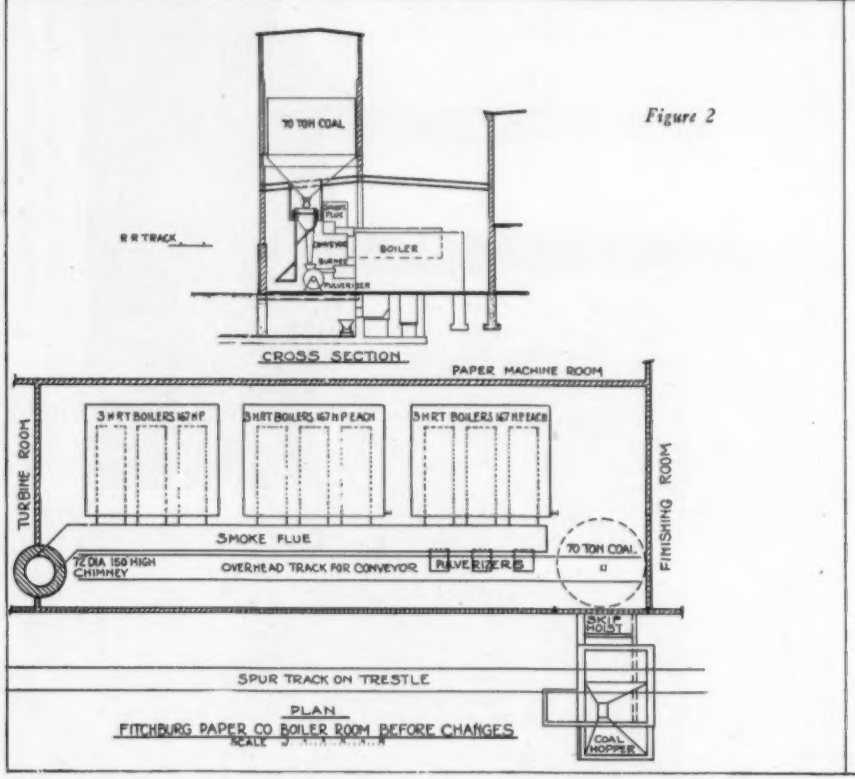


Figure 2

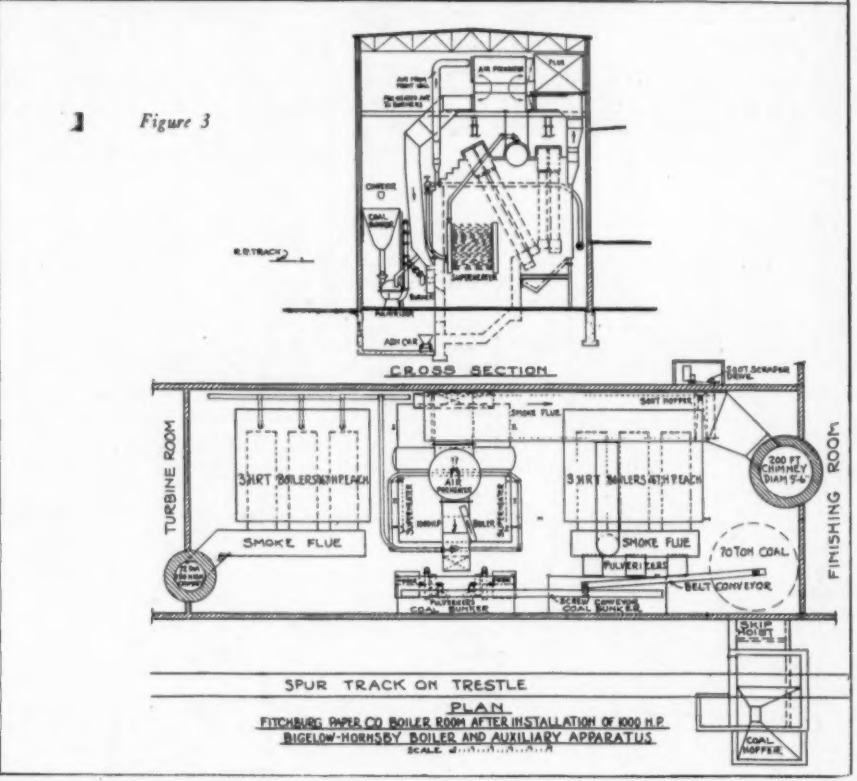


Figure 3

Description of Equipment

The equipment installed was as follows:

Boiler—One 1000 h. p. Bigelow-Hornsby boiler with slag screen to operate at 250 lbs. pressure, made and erected by The Bigelow Company of New Haven, Conn., and shown in Fig. 3.

Air Preheater—One Ljungstrom air preheater made and installed by The Air Preheater Corporation of New York.

CURVES BASED ON 200% BOILER RATING
———Refer to 550° F. entering gas temperature
- - - - - - Refer to 650° F. entering gas temperature
Subject to tolerances as specified in proposal

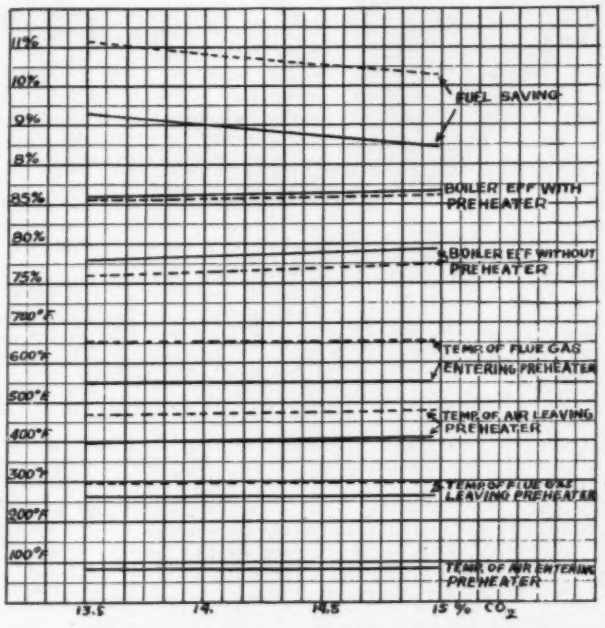


Fig. 5—Estimated performance of Ljungstrom air preheater on 1000 h.p. Bigelow-Hornsby boiler equipped with pulverized coal

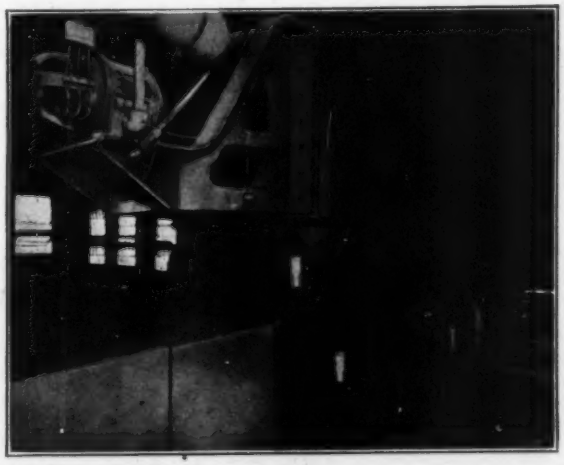


Fig. 6—Ljungstrom air preheater installation at Fitchburg Paper Co.

This was guaranteed, when the boiler was operating at 200 per cent of rating, to decrease the temperature of the flue gases from 550° F. entering the preheater to 266° F., and raise the air required for combustion from 80° F. to 400° F. This corresponds to an increase of the boiler efficiency from 78 per cent without preheater to 86 per cent with preheater, equal to a fuel saving of 9.3 per cent.

The curves furnished by the makers, showing the performance of this apparatus under varying conditions, are interesting and are shown in Fig. 5.

The apparatus is shown by Fig. 6 and its location by Fig. 3. Its actual performance with the boiler operating at about 180 per cent rating is as follows:

Flue gas temperature entering preheater	500° F.
Flue gas temperature leaving preheater	215° F.
Air leaving preheater	390° F.

Superheaters—Two Foster radiant type superheaters for 150° superheat, installed one in each side wall of the furnace. These superheaters, located as they are, act as a protection to the side walls. They were furnished by the Foster Wheeler Corporation of Boston. Their location is shown by Fig. 3 and the exterior headers are shown by Fig. 7.

Pulverized Coal Equipment—Two Atrita coal pulverizers and Riley low pressure burners, made and installed by the

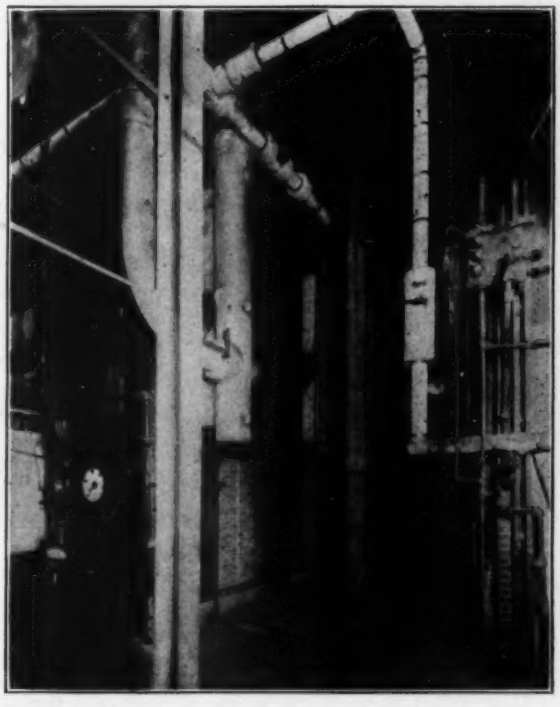


Fig. 7—Exterior headers of Foster radiant type superheater installation at Fitchburg Paper Co.

Riley Stoker Corporation of Worcester, Mass. This contract included all coal piping between the pulverizers and burners which are located in the front wall of the furnace. Each pulverizer will operate the boiler at about 190 per cent rating, and either or both are arranged to operate both burners.

The pulverizers, coal conveying pipes, burners and air blast box are shown by Fig. 8 and Fig. 9.

Fig. 10 shows a curve giving guarantees made for this apparatus under varying conditions.

Soot Blower—A system of soot blowers was furnished and installed by the Diamond Power Specialty Corporation of Boston.

Furnace—The design of the furnace is shown by Fig. 3. Its principal dimensions are 13'-8" from front to rear wall, 19'-4" wide, containing 6,600 cubic feet. The front wall is air cooled, and it and the flat arch covering the top of the furnace were designed and furnished by M. H. Detrick Company of New York.

The side walls are lined with veneer blocks backed with first quality fire brick; the outside walls are of second quality fire brick. The bottom of the furnace is air cooled. The veneer blocks and all fire bricks were furnished by McLeod & Henry Co. of Troy, N. Y.

The brick setting was installed by The Frank E. Ross Company of Boston.

The details of the furnace design were the result of the experience of The Frank E. Ross Company, the Bigelow Company, the Riley Stoker Corporation, McLeod and Henry Co., M. H. Detrick Company and Samuel M. Green Company. It has proved satisfactory.

Chimney—A new chimney was built with a capacity for the entire new boiler plant. It is 200'-0" high with a 9'-6" diameter flue. It was furnished and erected by the Alphons Custodis Chimney Construction Company of New York.

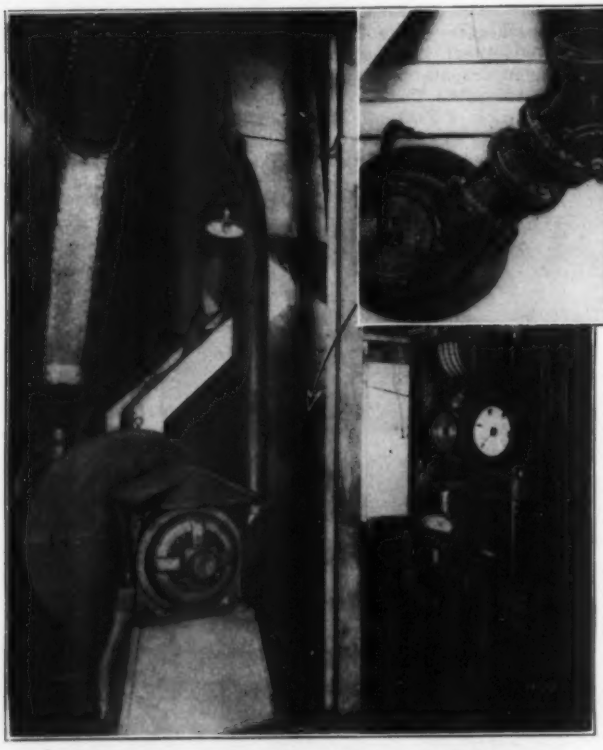


Fig. 8—Riley Stoker Corporation pulverizers, showing coal conveying pipes, burners and air blast box at Fitchburg plant

Flue—The flue from the new boiler to the new chimney is of capacity for the entire plant and was made and installed by the D. M. Dillon Steam Boiler Works of Fitchburg, Mass.

Soot and ash that accumulates in the flue are removed by a scraper conveyor and that which accumulates in the rear of the boiler is removed by a steam jet conveyor. The flue scraper was made and installed by the Guarantee Construction Co. of New York and the steam jet conveyor was made by Girtanner Engineering Corporation of New York.

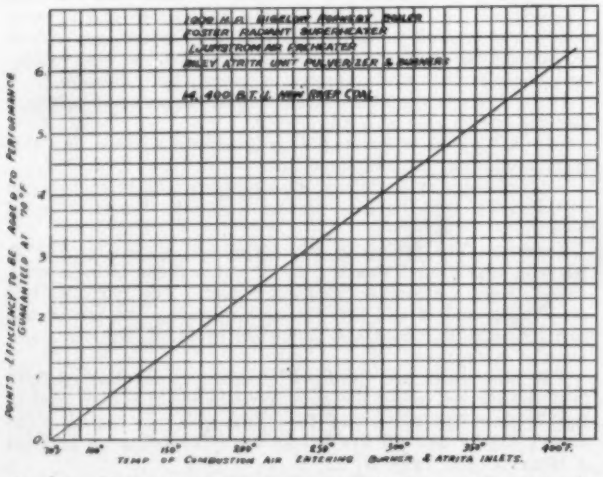


Fig. 10—Chart showing guarantees made for apparatus herein noted, under varying conditions

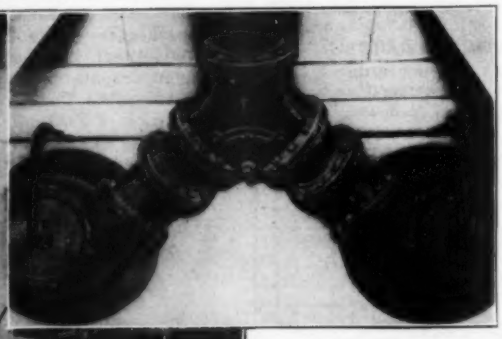


Fig. 9—Air blast box on Atrita coal pulverizer system at Fitchburg plant

Coal Supply—It was impossible to use the weighing larry which supplied coal to the old boilers, owing to its location and limited capacity. It was replaced by an inclined belt conveyor leading from the outlet of the 70 ton coal bunker to a horizontal screw conveyor running the length of the boiler room. The belt conveyor is equipped with a weightometer and magnetic pulley.

Two 30 ton bunkers were installed—one over the old pulverizers feeding the three h. r. t. boilers and one over the Riley equipment. The three h. r. t. boilers which are hand fired are supplied with coal from the screw conveyor if it is necesary to operate them.

This equipment was furnished and installed by the Guarantee Construction Co. of New York.

Boiler Instruments—The feed water is measured by a Republic meter arranged so that the recording apparatus is located in the office of the plant engineer. It was furnished by the Eagle Oil and Supply Company of Boston.

The steam generated is measured by a Bailey meter arranged to record, indicate and integrate steam flow and to record air flow. This instrument is located at the front of the boiler. It was furnished by the Bailey Meter Company, Cleveland, Ohio.

The CO_2 is indicated by a Ranarex CO_2 instrument furnished by The Permutit Company, New York.

The instrument board is shown by Fig. 7.

A 30" master pilot steam gauge was installed, furnished by The Ashton Valve Company of Boston.

Piping—The piping system for feed water, steam and blow-off was designed by the Consulting Engineers and furnished and installed by The Jennison Co. of Fitchburg, Mass.

The 8" steam supply main from the No. 4 boiler room to the No. 1 and No. 2 Mills is welded throughout its length and expansion is provided for by bends. Its general arrangement is shown by Fig. 11. No rolls were used, the movement of the pipe being cared for by the swing of the supporting rods.

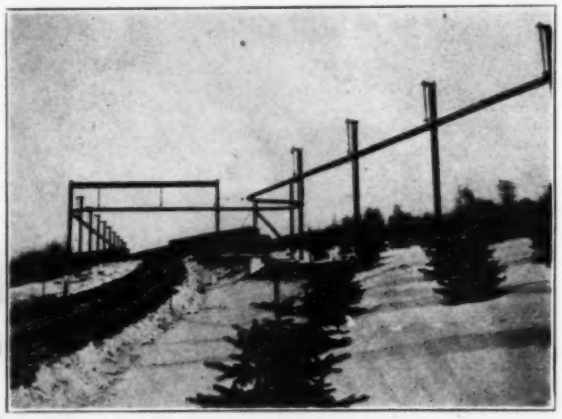


Fig. 11—Eight-inch steam supply main to No. 1 and No. 2 mills of Fitchburg Paper Co.

The 8" line has an automatic, self-closing valve in the No. 4 boiler room, arranged so that it will close should pressure on the delivery side fall below a predetermined pressure.

Feed water is controlled by a Copes feed water regulator furnished by Northern Equipment Co., Erie, Pa.

Pipe Insulation—All piping carrying superheated steam is covered with double thick 85% magnesia. The 8" line, where it is out of doors, is covered with double thick 85% magnesia and 1" of hair felt. Over this, is applied 3 ply roofing paper with cemented laps and joints and held on by copper wire.

Structural Steel—All of the structural steel for boiler, building and pipe supports was designed by the engineers and furnished by the Eastern Bridge and Structural Co. of Worcester, Mass.

Supervision—The buildings and foundations and installation of all the apparatus were supervised by Mr. E. B. Wright, plant engineer.

Starting—On Friday, April 22, 1927, the boiler was fired and ran about two hours. On Monday, April 25th, the boiler was put in operation and has continued from that time to the present, supplying all steam required by the No. 1, No. 2 and No. 4 Mills. All apparatus has operated without trouble and the plant is considered satisfactory from all standpoints.

The engineers wish to express their appreciation for the complete cooperation given to them by the company officials, the plant engineer and all of the contractors.

New Steam Boiler Installation at River Raisin Plant

Higher Generation Efficiency and Lower Maintenance Costs Obtained

THE present boiler room installation at the plant of the River Raisin Paper Co., Monroe, Michigan, is the result of several years of effort on the part of the officials of the firm, but particularly on the part of Mr. Grant E. Miller, chief engineer, and his co-workers. After a careful study of the old plant and comparing with more modern design they were convinced that great savings would accrue through a complete rebuilding of the steam boiler units.

Before reconstruction there were three separate boiler houses—one supplying steam to mill designated as No. 1, the second supplying steam to mill No. 2, and the third (the boiler house in which the present installation has been made) supplied steam to mills Nos. 3, 4 and 5. In each case the individual boiler plants supplied steam for both power and process work.

The boiler house at No. 1 mill operated five 150 h. p., return tubular, hand-fired boilers equipped with shaking grates, while the plant supplying mill No. 2 with steam was equipped with eight 150 h. p., return tubular boilers, also hand-fired and equipped with shaking grates. These two boiler installations consumed on an average a total of 150 tons of coal per day.

The boiler installation which supplied mills Nos. 3, 4 and 5 with steam consisted of eleven 250 h. p., return tubular boilers equipped with Laclede-Christy chain grate stokers, and three 630 h. p. McNaull water tube boilers, using Green chain grate stokers. This installation required on an average of 250-300 tons of coal per day.

The total steam boiler installation, consisting of the three individual steam boiler plants, supplying steam for an installation producing approximately 50 tons of strawboard per day and three hundred fifty tons of board, as well as finishing these products into paperboard containers, both containers of solid board and corrugated board, used approximately 400-450 tons of coal per day.

The maintenance on all of the boiler equipment was high, steam generation efficiency low, and the labor cost of operating high. The two plants supplying mills Nos. 1 and 2 with steam operated on a three shift day, while the third plant functioned on two shifts. The total number of employees connected with the three plants averaged about sixty.

When it was decided to make changes in the boiler installation, it was found that the floor area of the building, housing equipment supplying steam to mills Nos. 3, 4 and 5, was sufficiently large to permit the installation of five, 1296 h. p., Erie City Iron Works, three-drum, inclined water tube boilers, together with suitable fuel pulverizing equipment, coal and ash handling equipment, etc. About the only changes required in the building was the raising of the roof, and side and end walls about 28 feet, and to remove much of the old structural steel work within the structure.

Gradually and while operating the paper mill units constantly, the old boiler equipment with the exception of three McNaul boilers were removed, three new boilers installed along with the necessary coal handling equipment, pulverizers, etc., to handle the complete unit, and the required changes made in the building. The fourth boiler is now on order and will soon be ready for installation. The installation of this boiler will require the removal of one of the three remaining boilers of the old installation and the removal of the other two will leave sufficient room for the fifth unit.

As work progressed with the installation of the present boilers, it was possible to cut-out both of the other steam plants supplying steam to mills Nos. 1 and 2 and to generate sufficient steam in this individual unit to supply all of the five mills with process steam as well as to generate about 1200 kw. hrs. for power purposes. In addition to this amount of power, approximately 1500 kw. hrs. are purchased from the Detroit Edison Co.

In brief, the installation now consists of two horizontal 9'0"x11'4" Permutit Water Softeners, two Hoppes feed water heaters, three Copes feed water regulators, one Worthington three stage boiler feed pump, as well as two Manistee Iron Works Centrifugal pumps for emergency with rated capacity 500 g. p. m. each against a head of 400 feet, R. H. Beaumont Co. coal handling equipment including coal crusher, magnetic separator, coal conveyor, skip hoist, weigh larry, etc., Erie City Boiler Works, Seymour coal pulverizers, boilers and furnaces as well as General Electric steam flow meters, Ranarex carbon dioxide recorders and indicators, and Hayes draft gauges. The pulverizers are controlled automatically by pushbutton equipment of the Electric Controller Co. In addition to this equipment used to produce and control the generation of steam, is a well designed layout for disposal of ashes supplied by Allen Sherman Hoff Co.

Before going into detail relative to any of this equipment, let us follow the two materials, coal and water, through the plant. A flow diagram would indicate the coal passing through crusher, over a magnetic separator to skip hoist and elevator to bunkers, dropped into weigh larry, thence to pulverizer and into furnace; while a flow diagram of the water entering boilers would show the water coming from two sources—condensate from paper machine dryers and heating system, and city water supply. Such a chart would indicate the city water supply entering the Permutit water softeners, thence as make up water to Hoppes feed water heaters where it unites with condensate water, thus as an individual supply from that point controlled through Copes feed water regulators and under sufficient pressure created by Worthington multistage boiler feed pump into boilers, with steam as the outcome of the application of heat to the water contained in the boiler tubes.

Water Softening Equipment

The water softening equipment installation consists of two 9'0"x11'4" horizontal Permutit water softening steel tanks, together with an 8'0" diameter x 4' high steel saturator or salt brine tank with ejector and other necessary pipes and fittings. This installation is located about 45' above basement floor upon a specially designed floor to support the installation, and is capable of handling 50,700 gallons in 7½ hours, based on the use of city water having a hardness of 149 parts per million as CaCo three or 9 grains per U.S. gallon. The estimated average rate of softening is 112 gallons per minute with a maximum rate of 262 gallons per minute. The wash rate of the system is 370 to 465 gallons per minute and requires 229 pounds of salt as saturated brine for regeneration.

A test bottle is supplied for use with the system to aid in ascertaining the relative hardness of the softened water. This bottle is filled with water to a 40 cc. mark and a definite number of drops of soap solution added. The bottle is then shaken and if a good lather results, the water is considered soft. It is interesting to try this test on the unsoftened water as well as on the water which has passed through the softening units. No lather can be formed in the test bottle with the unsoftened water, whereas the softened water lathers immediately upon shaking the bottle.

Water entering the softeners in this installation must not exceed a temperature of 100° F. nor a pressure of 70 lbs. per square inch.

Hoppes Feed Water Heaters

The water from the water softening installation flows by gravity to an installation of two Hoppes feed water heaters where it is mixed with the hot condensate from the paper machine dryers, etc., the whole being heated to a temperature of 227° F. to 230° F. through the use of exhaust steam. Each heater has a rated capacity of 3000 h. p. or the approximate equivalent of heating 103,500 pounds of water per hour from a temperature of about 150° F. to 208°-210° F., with a sufficient amount of exhaust steam at atmospheric pressure. This high temperature boiler feed water means a saving of approximately 1½ per cent in coal consumption.

The tank of each heater has a bottom of cast iron, sides and top of steel, and is 50" in diameter and 18'0" long, and contains a heating surface of 850 square feet. Inside each tank are a number of horizontally spaced cast iron trays to materially increase the surface of water exposed to steam action and to act as scale forming surfaces for hard water.

The water from the heaters is discharged by gravity with a head of approximately 35 ft. into the suction of a 5" three stage Worthington boiler feed pump. Due to the initial head on this pump, it is capable of handling the high temperature water. The pump has a rated capacity of 750 g. p. m. against 210 lbs. pressure, and is directly connected to a 125 h. p. Allis Chalmers motor operating at 1750 r. p. m.

Copes Feed Water Regulator

The water from the boiler feed pump is thus pumped to each of the boilers in the series, the quantity of water entering each boiler being controlled by an individual Copes feed water regulator.

In brief, a Copes boiler feed water regulator consists of a composition metal expansion or thermostat tube, a feed control valve, and proper leverage connection from the expansion tube to the control valve. Installation of such a regulating device is made in such a way that the water level in the expansion tube is always the same as the water level in the drum to which it is attached, since the bottom end of the tube is connected to the water space of the boiler, and the top end of the tube to the steam space. An expansion of the thermostat tube opens the control valve in the feed line while contraction of the tube allows the valve to close.

Coal Handling Equipment

The coal unloaded from car into hopper as mentioned previously is fed uniformly by means of a reciprocating plate feeder, located directly beneath the outlet of the track hopper, to a double roll crusher where it is reduced to a size that would probably pass a 1½" mesh. Passing through the crusher, the coal is carried by means of an inclined steel apron conveyor to the skip loading hopper from which it is loaded into a skip hoist bucket—the bucket operating automatically in a vertical structural steel tower, discharging its contents at a point sufficiently high to enable the coal bunkers, of which there are at present two, to be filled by gravity through the aid of chutes.

The track constructed of ¼" steel plate and suspended from the track girders, is sufficiently large, approximately 10'x12' in plan, to receive coal from both doors of a hopper bottom car, and to discharge a 24-inch diameter lump. The bottom of the hopper is sloped with a minimum valley slope of 35° to insure self cleaning.

The double roll crusher into which the coal is fed from the hopper, consists essentially of two cast iron rolls, the faces of which are toothed, and of manganese steel, operating or revolving toward each other at the same rate of speed, thus drawing the coal into the mesh of the rolls and then carrying it through. The crusher used in this installation has a rated capacity of 45 tons per hour when operating on a desired product of 2", requires about 15 h. p., and has a roll speed of 36 r. p. m. The rolls of such a machine are each 30 inches in diameter with a 30-inch face.

The coal having passed through the crusher is collected in another steel plate hopper which in turn discharges it upon a standard inclined steel apron conveyor after having passed over a Cutler-Hammer D. C. current magnetic separator to remove all metal particles.

The coal is discharged from the conveyor into the skip loading hopper, also of ¼" steel plate which has a capacity of 1½ skip bucket loads. The bucket used in this instance has a capacity of 60 cubic feet or 3000 lbs. and travels, timed through the hoist winding machine which operates it, about 125 feet per minute. The hoist winding mechanism is operated by a 15 h. p., 1200 r. p. m., Allis Chalmers, squirrel cage, elevator type motor.

Another hopper is provided at the top of the skip tower to receive the coal from the skip bucket and to discharge it into each of the two bunkers used for coal storage. Each of the bunkers is constructed of steel plate in the form of a U and has a capacity of 250 tons.

A number of gates are provided on the bottom of each bunker to facilitate the removal of coal into a Beaumont weigh larry, cage operated, and of two tons capacity. This machine moves back and forth between the bunkers and the chutes to pulverizers.

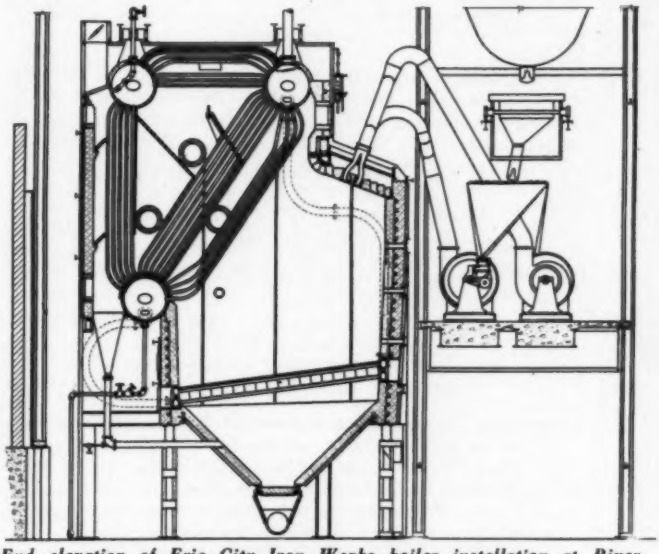
Coal Pulverizers

A pulverizer unit consists essentially of a properly housed and supported rotor consisting of pulverizing elements and a fan. The housing is of cast iron, lined with steel, while the rotating element in each of the pulverizers in this installation consists of two rows of steel or chilled cast iron paddles placed radially on a supporting shaft, a series of cast steel or chilled cast iron blades placed in the same way, and the fan element located on the opposite end of the shaft from the paddle section. In reality, it could be said that a machine might be divided into three sections. The coal entering the paddle section is reduced sufficiently in size to pass through a perforated screen area (holes about 5/16" in diameter) into the second or drum section where it is completely pulverized, and from which it is removed by the suction of the fan into and out of the fan or third section to the furnaces. Not only is sufficient air drawn through the fan to convey the coal to the furnaces but also to act as a primary air supply to support combustion. Secondary air is admitted through three rows of ports located in the front of each furnace.

Each pulverizer unit is driven by means of a 75 h. p. Allis Chalmers motor, the motor being directly connected to the fan end of the unit. These units are located on an operating floor about 21 feet above the basement floor.

Two No. 4 Erie City Iron Works pulverizers, each with a rated delivering capacity of 4000 lbs. of coal per hour when supplied with bituminous coal containing not over five per cent moisture of a size that will pass through a 1½" inside diameter ring, are used in conjunction with each of the three Erie City Iron Works boilers and furnaces now installed. It is claimed that these units when supplied with coal of proper

size and moisture content together with suitable power for driving will pulverize the coal, when the blades and paddles of the machines are new, to a point where an average of 75 per cent will pass a 200 mesh screen. The pulverization becomes coarser as the wear on the blades and paddles increases. The blades and paddles, however, are adjustable to permit taking up in case of wear. From several observations, it appears that about 2000 tons of coal per set of paddles and blades can be handled during the life of a set or a cost for paddles and blades of about three cents per ton.



End elevation of Erie City Iron Works boiler installation at River Raisin Plant

The rotor in each of the units, driven at 900 r. p. m., is equipped with 14 paddles and 36 blades. The floor space required for such a machine not including motor is about 14¼'x4¼' with a height of approximately 5¾'. The weight of a machine complete (not including motor) is approximately 20,000 pounds.

Boilers

Each of the three boilers set singly have a rating of 1296 h. p. where 1 h. p. equals the evaporation of 34½ lbs. of water from and at 212° F. The heating surface in each case is 12,930 square feet. Three drums (two upper and one lower), each 48" in diameter and 20' 5¾" long and 840 tubes of seamless steel are used in each boiler with all materials and construction conforming to the A. S. M. E. code. The distance from the floor line to center of lower drum is 15 feet.

In each case, the space required for the boiler setting, including brickwork, is 29' 8" long x 24' ¾" wide, and 47' 8" high to the top of steam nozzle. The maximum width inside furnace walls is 20' 5¾".

A water screen of seamless steel tubes, spaced on 9" centers expanded into steel headers is connected to the bottom and front upper drum to prevent ash fusion and to reduce the temperature of the walls of furnace. Such water screen is connected into the water circulation and forms an important heating surface.

The furnace is lined with firebrick 23½" thick to a line connecting the center of front upper drum to the center of the lower drum. Between this line and the extreme rear tube side walls is a fire brick lining 9" thick. The rear wall and a small portion of the side walls are lined with fire brick 4½" thick.

The front and side walls of the furnace have an average thickness of 30" with an increase in thickness from the top down of ½" per foot. The side walls of the boiler setting proper are 22" thick with the rear wall 17" thick. The arches are flat and of Bigelow type.

One stack of the old boiler installation is connected by steel breeching to the three furnaces. It was simply necessary to make a new opening in the side of stack and close up the old opening. The stack which is now used in conjunction with the three McNaull boilers can readily be used if necessary for the third boiler installation; that is, boiler No. 3 can operate with either stack. No. 4 boiler when installed will be connected to the second stack.

At the base of each furnace is an ash hopper from which the ashes are dumped into a sluiceway. The ashes are washed with water through this sluiceway into a concrete sump basin. From this basin, the ashes and water are pumped by means of a Morris open impeller centrifugal into a settling basin also of concrete but located outside of the boiler house.

In this basin, the ashes are permitted to settle, the water overflow and thus discharged. From time to time an Ohio hoist equipped with shovel is used to remove the ashes from the settling tank to car for transportation away from plant.

Naturally, because of the type of furnace, the quantity of ash is very small.

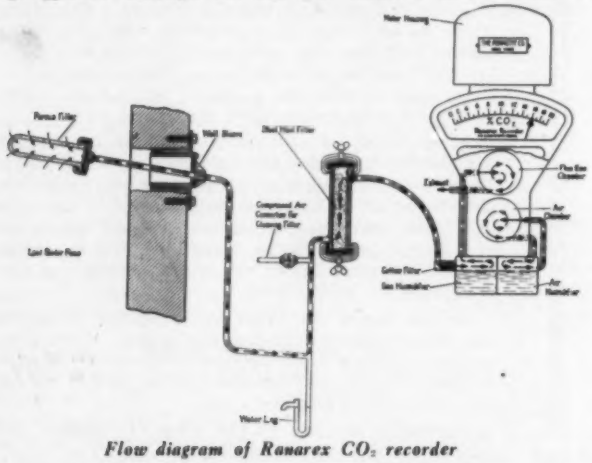
Control Equipment

The control equipment for coal handling machinery consists of a number of usual type starting boxes and switches in addition to a D. C. generator unit for charging the roll of the magnetic separator, panel board for control of voltage on the roll, and an Allen-Bradley automatic cut box for coal crusher.

The efficiency of combustion is known at all times through the records of Ranarex CO_2 recorders. One instrument is used in conjunction with each boiler, the gas being drawn

General view of boiler room installation at River Raisin Paper Co., Monroe, Mich., showing coal bunkers, coal pulverizers, recording instruments and front of furnaces. The track for in-coming fuel supply is shown in left foreground

from the flue ahead of the damper. The gas first passes through a primary filter where all suspended particles are removed and the moisture condensing from the gases upon cooling is collected into sealed waterlegs located beneath the filter area. From the primary filter, the gas passes through a secondary or final filter of cotton, and thence through one compartment of a double humidifier, where it is brought to the same degree of humidity and temperature as the comparing air which passes through the second humidifier simultaneously. Such a humidifier consists simply of a water container with a gas tight dividing wall, with the gases passing over the water surfaces. From the humidifier, the flue gas passes through the flue gas chamber and exhaust to



Flow diagram of Ranarex CO_2 recorder

the atmosphere, while the air is circulated continuously through its humidifier compartment and air chamber.

A fireman is, likewise, aided in his work by the installation of General Electric steam flow meters and draft gauges. One steam flow meter and one Hayes draft gauge is used with each boiler.

Typical records of one of the 1296 h. p. Erie boilers show average horsepower developed over a 24-hour period of 3396 h. p. or approximately 260 per cent rating, with a coal consumption of 2.15 lbs. per horsepower hour, and an evaporation of 13.95 lbs. of water per pound of coal.

Results of Present Installation

It will be remembered that the old installation of 24 boilers with a rated total horsepower of 6590 h. p. consumed on an average of 400 to 450 tons of coal per day. The present installation of three new 1296 h. p. boilers without the use of the three 630 h. p. old water tube boilers has had a total consumption of coal as low as 212.37 tons on a day when the total production of board was 356 tons. The estimates show that approximately 3342 lbs. of paper board were produced per ton of coal, or in other words approximately 1200 lbs. of coal were required to produce a ton of paper remembering that a portion of this fuel supplies steam for power purposes, and the rest for process work. It would probably be safe to estimate at least three to five pounds of steam for drying per pound of paper. This would mean a consumption on the dryers of the paper machines alone of 2,100,000 to 3,500,000 lbs. of steam per day.

With the fourth boiler installed, it is believed that the average coal consumption throughout the year including heating of plant, offices, etc. during the winter months will not be over 240 tons per day.

As mentioned previously about sixty men were needed to operate the boilers in the old combined plants, whereas it is now believed that with the new installation complete they will be able to operate with only twelve to fifteen men.

Future Plans

Plans are even now under way for additional improvements. Permutit oil remover filters for removing oil from condensation returns are now being installed. These consist of three closed tanks, 8′ diam. by 10′6″ long for holding material, together with dissolving tanks and alum and alkali pots.

A storage heater manufactured by Whittock Coil Pipe Co., Philadelphia, is also on order. This heater is to be used to heat the water supplied to the heaters in the paper mill, and is to make use of exhaust steam from steam engines supplying motive power to beaters. Likewise, although no definite plans have developed, it is probable that a bleeder turbine of a size sufficiently large to make their own current for electrical power purposes might be installed.

Principal Equipment of River Raisin Steam Boiler Installation

General:
- Building construction—brick and steel.
- Approximate floor dimensions—195′5″x77′.
- Boiler heating surface—total sq. ft., 38,790.

Boilers:
- Number and make—3-Erie City Boiler Works.
  - Type—3 drum inclined water tube.
  - Heating surface—sq. ft., 12,930 each.
  - Number of tubes—840 each.
  - Drum—diameter, 48″.
  - Drum—length, 20′0¾″.
  - Boiler working pressure—
    - Thickness of sheets 1¼″, good for 200 lbs. working pressure. Will work at 160 lbs. until turbines are installed—then at 200 lbs. pressure.
  - Total Steam Temperature—370.8° F.

Furnaces, Coal Handling Equipment, Stacks, etc.:
- Stack No. 1—10′ inside diam. x 209′ high.
- Stack No. 2—8′ inside diam. x 209′ high.
- Furnaces—Erie City Boiler Works.
- Water cooling per furnace (water screen)—405 sq.. ft.
- Ash Gates—Allen Sherman Hoff Co.
- Ash Handling Pump—Morris Machine Works.
- Coal Handling Equipment (crusher, conveyors, weigh larry, skip hoist, etc.)—R. H. Beaumont Co.
- Coak Pulverizers (6)—Erie City Iron Works.
- Automatic Push Botton Control on Pulverizers—Electric Controller Co.

Boiler Feed System:
- Water Softening Equipment—The Permutit Co.
  - Type—Horizontal 9′0″x11′4″.
  - Number—2.
  - Capacity—112 g. p. m. average.
  - Capacity—262 g. p. m. maximum.
- Oil Removal Filters—The Permutit Co.
  - Type—Closed tanks 8′x10′6″.
  - Number—3.
  - Capacity—14,000 gallons of water per hour.
- Feed Water Heaters—Hoppes Mfg. Co.
  - Number—2.
  - Heating Surface—sq. ft., 850 each.
- Boiler Feed Pump—Worthington Pump & Mchy. Corp.
  - Capacity—750 g. p. m. against 210 lb. pressure.
  - Type—5″ three stage centrifugal.
- Booster Pump—Worthington Pump & Mchy. Corp.
  - Type—Single stage, double suction impeller.
  - Capacity—450 g. p. m.
  - Driven by a 50 h.p. induction Allis-Chalmers motor and automatically controlled by a Mercon regulating valve actuated by a mercury column and attached in the delivery line of the pump, holding the pressure constant at 75 lbs. pressure regardless of the city water pressure on the intake of the pump, or the amount of water required for regular service, or the full capacity for back washing the softeners. This valve is manufactured by the D. H. Skeen & Co., Chicago.
- Emergency Pumps (2)—Manistee Iron Works.
  - Capacity—500 g. p. m. each against 400′ head.
- Feed Water Regulators—Northern Equipment Co.
  - Type—Copes.
  - Number—1 for each boiler.

Gauges and Meters:
- Steam Flow Meters—General Electric Co.
- Draft Gauges—Joseph W. Hayes.
- CO_2 Recorders (Ranarex) The Permutit Co.

Application of Meters in Paper Mills

Control of Steam Generation and Distribution and Other Uses

By H. E. WEAVER
Bailey Meter Company, Cleveland, Ohio

IN THE paper industry, the economical generation and distribution of large quantities of steam is a vitally important problem, and intelligent solution of this problem requires the use of dependable metering equipment. The use of meter records permits accurate allocation of steam costs and more than this, makes it possible to definitely establish and to daily repeat the most efficient conditions for producing and using steam. The large savings which result from the proper application of meter data and the satisfaction of having data on each process at the fingertips are ample compensation for the money, time and effort required to establish complete metering records.

Steam Generation

Users of meters throughout the United States and Canada have found from experience that the simplest device available as an operating guide usually proves the most effective, due to the fact that its records are the most easily understood by the operators and the maintenance cost is small.

The boiler meter which records steam flow, air flow and flue gas temperature, the three important inter-related factors bearing on the efficiency of boiler operation, has found general favor throughout the paper industry, due to its simplicity of design, its rugged construction and dependable accuracy.

When a meter of this type is installed, an engineering representative of the manufacturer conducts a combustion test on the boiler and adjusts the air flow mechanism so that when the correct quantity of air is being supplied to generate the recorded amount of steam most efficiently, the two records of steam flow and air flow will coincide on the chart. During this test the characteristics of the particular installation are taken into consideration, and the adjustment of the meter is made, so that the combined loss to the stack, to carbon in the ash, and to furnace maintenance, will be at a minimum.

After the initial adjustment, the fireman is provided with a simple, easily followed guide. If the blue air flow record is above the red steam flow record, the fireman is warned of a loss due to a surplus of air; or if the blue record is below the red record, he knows at once that insufficient air for correct combustion is being supplied, and the procedure required in either case to bring the two records together is apparent. The boiler meter is suitable for use with any type or size of boiler regardless of the kind of fuel or firing equipment.

The record of flue gas temperature on the same chart with steam flow and air flow is a continuous, dependable check on the efficiency of heat transfer, and shows at once any change in the condition of boiler tubes or baffles.

The effectiveness of boiler meters recording steam flow, air flow and flue gas temperature is evidenced by the report received some time ago from the Great Northern Paper Company in Millinocket, Maine, stating that the installation of this type of meter on their boilers had resulted in saving approximately 4,250 tons of coal per year. As a result of the efficient performance of the initial installations of this equipment, this company has now equipped 25 boilers in their several plants.

In an article for one of the power plant magazines, Mr. H. G. Funsett, general manager of the Hagar Strawboard and Paper Company, Cedarville, Ohio, stated that the most profitable piece of equipment they had ever installed was a boiler meter to indicate, record and integrate steam flow from the boiler, record air flow supplied the furnace for combustion and to give a record of flue gas temperature as well as an indication of furnace draft.

It is not an uncommon occurrence for meters of this type to return the initial investment in from three to six months through improved operation reflected not only in actual reduction in fuel consumption but also in increased capacity and reduction of labor incident to boiler operation. Boiler meters when installed on all the boilers in a plant, show which boilers are loafing and indicate undesirable conditions and poor operation, such as holes in the fuel bed, leaky boiler setting which admits excess air, defective baffles, insufficient draft or incorrect windbox pressure, poor feed water regulation, dirty tubes and other points which are detrimental to best efficiency.

Figure 1 illustrates the boiler room panel serving three 1200 h. p. Stirling boilers fired with pulverized fuel at the Mead Pulp and Paper Company's plant in Chillicothe, Ohio. The equipment illustrated includes multi-pointer gauges for drafts and pressures, boiler meters, a turbine meter to give records of steam flow, pressure and temperature and a feed water meter giving records of flow and temperature.

Fig. 1—Meter panel at the Mead Pulp & Paper Company's plant in Chillicothe, Ohio

Ungoverned use of steam in process work frequently offsets much of the care exercised in obtaining efficient steam generation. It is very essential that the steam going to the sulphite mill, groundwood mill, paper mill, or the sulphate mill and evaporators, etc., be accurately measured and the records carefully studied.

Further, it is just as essential to meter the steam to individual machines and processes at the several mills, due to the fact that in this way and this way only can the steam cost be effectively reduced. The steam flow record to a given mill may show excessive steam consumption at this particular mill, but unless chart records on the individual processes within the mill can be obtained, the responsibility for the excessive use of steam cannot be accurately and definitely placed.

A number of paper mills are measuring the steam supplied for drying and it is found

that the date, in pounds of steam per pound of paper, as obtained from these meters gives important information on the following points:

First: A comparison of the steam consumption from day to day shows when the drying felts become dirty and should be cleaned or renewed, since clogged or dirty felts results in higher steam consumption.

Second: This record shows whether the pressure on the roll at the wet end of the machine is too great or not great enough. Insufficient pressure results in more water being left in the sheets, to be removed by steam in the dryers. Incidentally this record shows breaks on the machine.

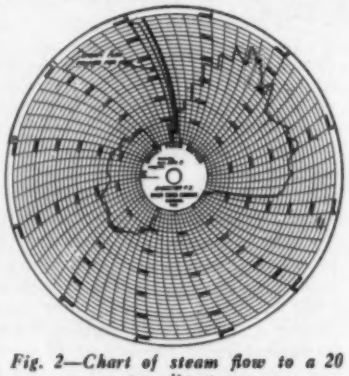


Fig. 2—Chart of steam flow to a 20 ton digester

In one instance where a machine was driven by a steam turbine and most of the drying was done by exhaust steam from the turbine, considerable trouble was experienced, resulting in a non-uniform quality of paper. Irregularities in the steam flow record of a meter on the steam line to the paper machine auxiliaries were investigated, and found to coincide with the dumping of a large steam trap. Due to the incorrect manipulation of valves in the lines to the trap, high pressure steam from the point ahead of the turbine nozzle was being fed to the steam trap. This resulted in a variation in turbine speed every time the trap dumped, and the paper produced was not of uniform quality. The source of the difficulty would probably have gone undetected for some time had it not been for the operation of the meter, the irregularities of which were synchronized with the dumping of the steam trap, giving the operator a clue to the trouble.

Meters on steam to individual digesters have proven indispensable to a number of users. In this connection we would call attention to Fig. 2 which is a reproduction of a fluid meter chart, showing a characteristic record of steam flow to a 20 ton digester on which the length of cook was approximately 11 hours. 12 hour charts are used on this particular meter, so that the chart is changed after each cook.

Observation of the chart just mentioned will show that a very definite system of cooking is employed from day to day, and in fact the operator is instructed to pattern each cook after a record similar to that illustrated, which has been definitely established as embodying the most desirable steam flow characteristics for minimum steam consumption required to obtain the highest quality pulp.

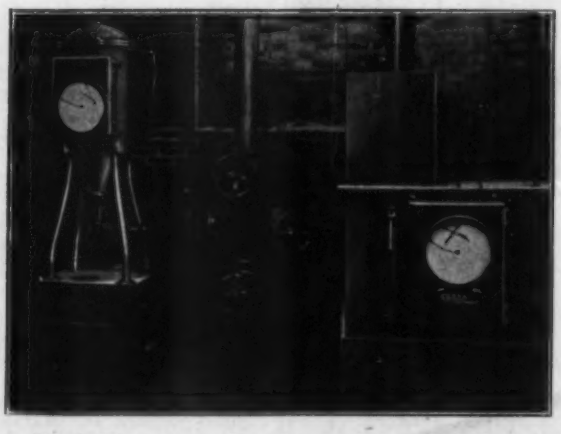


Fig. 4—Weir meter and gravity recorder on black liquor in a paper mill

The cooking period is divided into two separate periods, with the first part, which requires a greater amount of steam, extending over approximately 3½ hours, the steam then being shut off for slightly over three hours. The second portion of the cook requires a much smaller amount of steam than the first, and ends in about four hours. The large quantity of steam used momentarily at the zero hour on this particular chart is the result of admitting steam to agitate the pulp which collects at the bottom of the digester after blowing, due to the fact that the blow pit mouth is considerably higher than the outlet of the digester.

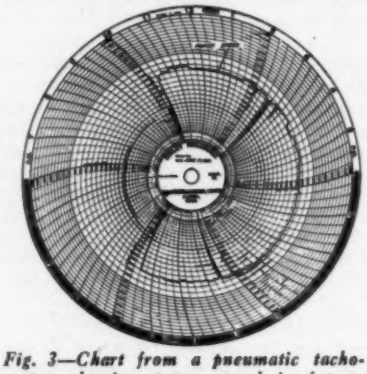


Fig. 3—Chart from a pneumatic tachometer showing paper speed in f. p. m.

Meters used for this service have proven very effective in improving the quality of the product and reducing the steam consumption to a record minimum. It is particularly desirable to measure steam flow to individual digesters in addition to simply recording steam pressure and steam temperature, since it is then possible to calculate the actual B. t. u. input. It is quite frequently the case that records of pressure and temperature alone are misleading in that they do not represent the conditions throughout the mass of pulp within the digester, due to improper circulation and other factors. Records of steam pressure and temperature can be given on the same chart with steam flow, thus giving the whole story on one chart.

Fig. 5—Indicating and recording electrically operated flow meter installed in a large paper mill in the Northwest

Paper Machine Speed

A chart obtained from a pneumatic tachometer installed on a paper machine is reproduced in Fig. 3. The rotor of this tachometer is driven from the spring roll, so that a break in the paper is shown instantly on the record, and the necessity of installing a break recorder is eliminated. An indicating element is also installed, this being placed at the wet end of the machine so that the operator has a continuous guide in forming the proper sheet for each grade of paper.

The data furnished by this installation has been invaluable to the mill force and has been responsible for a steady increase in paper production. Two more recorders and indicators for other machines have been installed as a result.

Black Liquor Measurement and Gravity

Fig. 4 shows a gravity recorder and a weir meter installed

on black liquor at one of the mills of a large paper company in New England to serve as operating guides and to provide the records of soda mill performance. The gravity recorder gives the specific gravity of the black liquor entering the evaporator and aids the operator in maintaining uniform gravity of liquor to the recovery department. To permit regulating the amount of steam necessary in the evaporation process so as to maintain the output from the evaporators at a given specific gravity, the weir meter records and integrates the amount of liquor entering the evaporator.

Why It Pays to Clean Steam

Some Astounding Facts About Water Impurities and Their Damaging Effects

By J. LUCIEN JONES
Adams-Bradshaw Company

IT IS only within the past very few years that the average steam engineer has had any appreciation of the necessity for cleaning steam. Prior to that time it was considered that steam from any good boiler was perfectly clean and satisfactory for use in any piece of steam-using equipment.

Extensive research, however, has proved conclusively that steam leaving even the very best of boilers carries with it a large amount of impurities.

These impurities are the salts that occur in the original raw feed water in solution, whatever solids are in suspension, and the end salts of the feed water treating system. It is impossible to operate a boiler at any rating that is great enough to justify the investment that has been made in it, without picking up some of these salts with the steam.

Why Entrainment Occurs

This is the way they are picked up. When the small or large bubbles of steam form in the boiler tubes, they rise to the surface of the water in the steam drum. In breaking through the surface film that is always present on water, they throw tiny drops of water up into the steam space. The water of which these drops is composed is boiler water, of the same concentration as the boiler water in the rest of the boiler, and cannot, by any stretch of the imagination be conceived to be "distilled water." It is water that has not been converted into steam, but is thrown up into the steam space mechanically by the rapid movement of the steam bubbles.

If the boiler is operating at a sizable rating, that is, if steam is being removed through the nozzle at a rapid rate, the rush of steam at high velocity will whirl away the entrained drops of boiler water with it.

How much water will the steam take with it? Let's take an average example: Say, a thousand horsepower boiler giving 99 per cent dry steam, and operating at 200 per cent of rating.

$$2.00 \times 1{,}000 \times .01 = 600 \text{ pounds per hour.}$$

This average boiler delivering 99 per cent dry steam is carrying away from the boiler six hundred pounds of boiler water every hour.

Entertainment Is Boiler Water—Not Condensed Steam

Remembering that this is not condensed steam, but is water of the same concentration as the rest of the water in the boiler, how many pounds of impurities does this 600 pounds of boiler water contain? To determine this, we must know the concentration of the water in the boiler. Assuming an average figure of 200 grains per gallon for this, we find that the water that goes out with the steam contains:

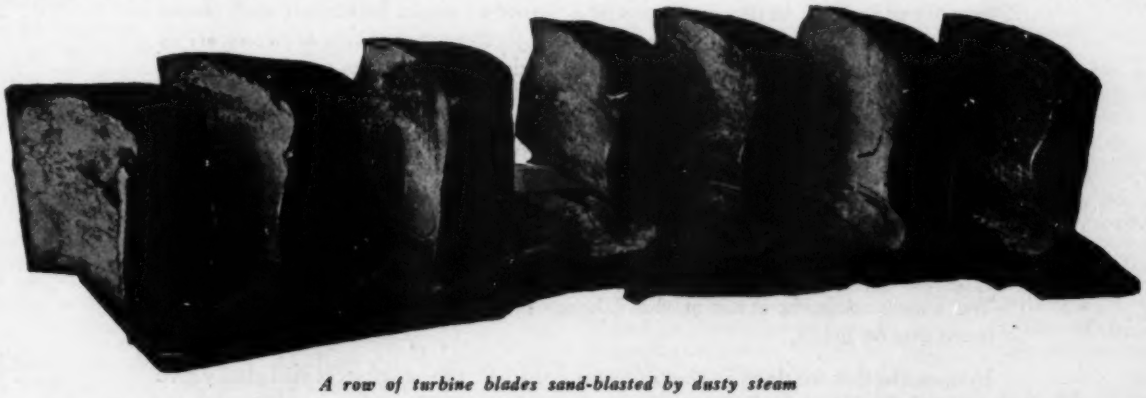
$$\frac{600 \times 200}{7{,}000 \times 8.33} = 2.06 \text{ pounds per hour.}$$

On first consideration this may seem to be an insignificant amount of material for a thousand horsepower boiler to "throw." But second thought tells us that this is an operation that continues hour after hour, and day after day, year in an year out.

2.06 (pounds per hour) x20 (hours of operation per day) x 300 (days of operation per year)—12,360 pounds per year.

Many Tons of Impurities Carried Per Year

Surely six and a quarter tons of solid impurities thrown into your steam lines is worth thinking about! Remember, this is per boiler! Also, remember that this is 99 per cent dry steam!



A row of turbine blades sand-blasted by dusty steam

Suppose you have eight boilers giving 97 per cent steam! Then you multiply the 6¼ tons by 8 and by 3=150 tons of impurities per year.

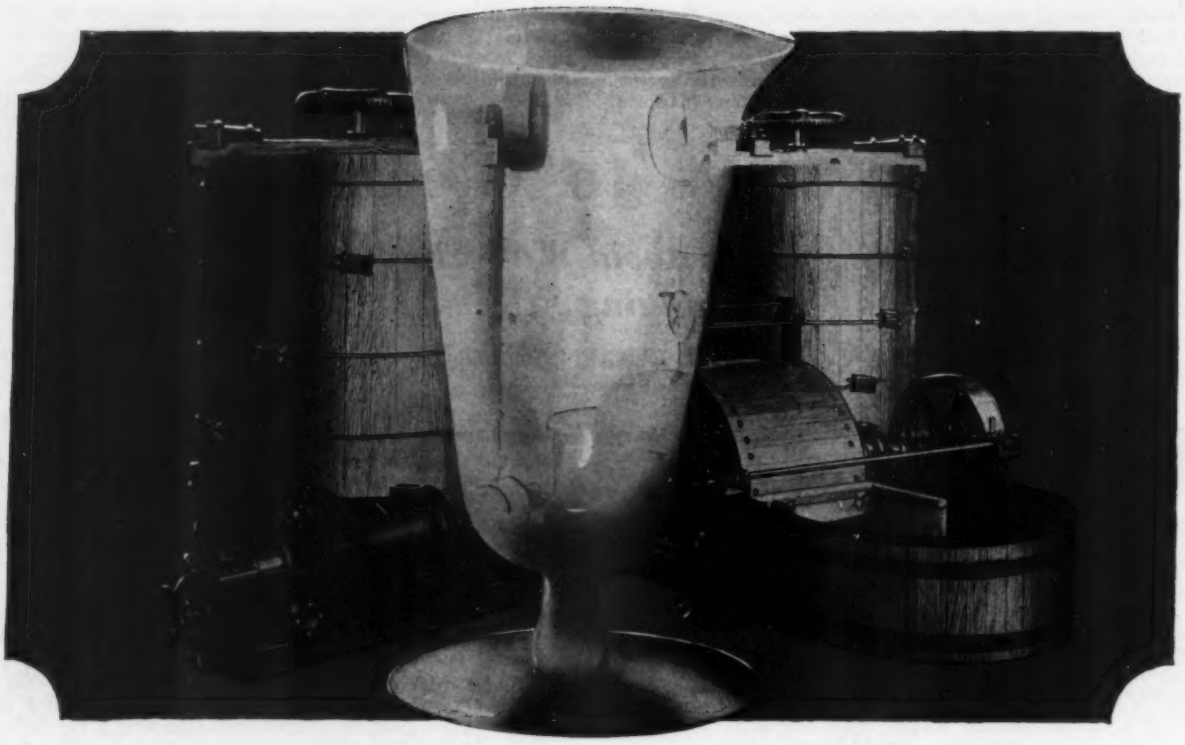
Two questions naturally occur as soon as this fact is realized:

1—Does it increase the revenue from the plant to prevent this material from going into the steam lines? If so, to what extent?

2—Is it possible to prevent this material from leaving the boiler with the steam? If so, how is this desirable result accomplished, and what does it cost?

The answer to both questions is the same—YES.

In the first place, it is inconceivable to imagine a large quantity of solid matter going through the ramifications of



Pygmies that Control the Giants

Practical paper making machinery reduced to laboratory size. Beaters with a capacity of as little as three quarters of a pound of stock. Miniature stuff chests that store and agitate stock perfectly. Baby Jordans that refine as effectively as their big brothers. Rotary steam dryers that dry hand samples quickly. Pounds of stock, instead of tons, to work with.

The modern tendency is to let laboratory tests control production. With this small scale Noble & Wood equipment you can test, experiment and develop plant processes and output with reasonable certainty and lowest expense.

Changes in processes resulting from laboratory tests can be made in the mill with a definite foreknowledge of results.

We keep a constant stock of this laboratory equipment so that prompt shipment can be made.

Investigate this modern system of plant control. Our engineers will gladly give you full details and advice.

NOBLE & WOOD
MACHINE COMPANY
Hoosick Falls New York

a steam plant without causing financial losses:—conversely, the elimination of the foreign matter cannot fail to result in at least a great reduction of those losses, with consequent yearly money saving.

Saving Money in the Superheater

Starting from the boiler nozzle, the first saving that can be made is in the superheater. It can be kept clean, or, rather, can be prevented from becoming fouled. This is a direct saving in several ways. First a clean superheater passes heat from hot gases to steam freely, with no insulating lining of solid matter to interfere. This means higher superheat from the same fire, which, in turn, means higher efficiency of steam-using equipment. Second, a clean superheater does not have to be turbined at considerable expense periodically. Third, elements that are clean do not burn out, causing costly replacement, to say nothing of the time lost.

It is generally recognized that the prime function of a superheater is to increase the temperature of steam. If it is made to act as auxilliary steam generating surface through the plant capacity is out of commission, and this is a loss that must be considered. It is often very large.

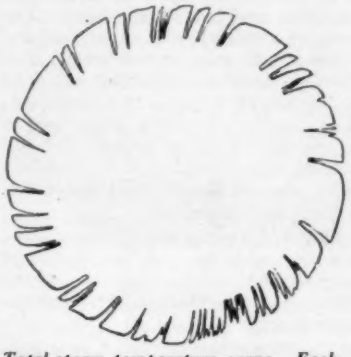
And Engines

What does impure steam do to an engine? It causes rapid wear of rings, packing, and cylinder walls. It requires greatly increased lubrication, because oil must be added, first to neutralize salts in the steam, next to wash them away, finally to lubricate the walls. It has been found that the change from ordinary steam to absolutely clean steam usually results in a saving of from one-quarter to one-third of the lubricating oil bill.

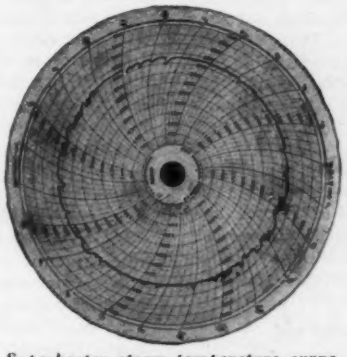
It Pays to Keep Steam Lines Clean

This is, however, the smallest saving. The really large savings come from keeping the rings in service in good condition for long periods of time, and in not having to rebore cylinders, with consequent costly shutdown.

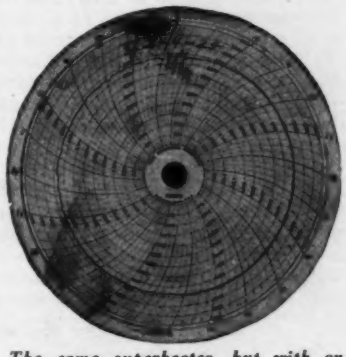
It is surprising the amount of saving that comes from keeping impurities from passing through steam lines. One company that made the change from ordinary to standard



Total steam temperature curve. Each dip was caused by boiler water entering the superheater with the steam



Superheater steam temperature curve. Notice the dips and irregularities caused by water in the steam



The same superheater, but with an efficient steam purifier in action in the boiler drum

having several per cent water thrown into it continuously, its main value is, to say the least, seriously diminished.

The way in which a superheater becomes clogged with impurities is readily understood when the large amount of impurities carried away from the boiler drum, even with a small percentage of moisture in the steam is considered. These impurities are either in solution in the water that the steam carries, or are in suspension. In either case, when the water is evaporated in the superheater, the impurities are left as a hot, gritty powder. Part of this remains in the superheater, coating the tubes and causing the losses enumerated above. The remainder of it is carried through into the steam line to turbines, engines, pumps, dye vats, processes, wherever the steam goes. The percentage that stays in the superheater, and that which goes on through is dependent upon the shape of the superheater, the velocity of steam through it, and other causes.

Protecting Costly Turbines

What are the disadvantages of sending wet, or dusty, steam to a turbine? Any engineer will answer, at once, "Erosion and fouling of blades and nozzles." This is the correct answer. And it leads directly to lowered efficiency and expensive reblading.

The shapes of turbine blades are carefully calculated for maximum efficiency under certain definite operating conditions. Anything that interferes with those carefully calculated shapes, either by erosion or fouling, reduces the efficiency of the machine. After the efficiency has decreased a certain percentage, the machine is taken out of service and either cleaned (if that is sufficient) or rebladed.

In either case, there has been a steady increase in water rate, all of which is pure loss, and preventable loss, because with the use of clean steam the water rate could be held at normal throughout the useful life of the turbine. The expense of reblading, likewise, is pure loss, because it also can be prevented in the same manner. While reblading, part of specification steam cut down their pipe line repairs at least $2,500 per year. Reducing valves were formerly cut away by the impurities in the steam, and required replacement. Other valves would clog and require frequent cleaning, with consequent shutdown.

Another company, a paper company, increased the production of their paper dryers nearly 13 per cent, solely due to the use of clean steam, as compared with their old use of dirty steam.

The matter of keeping meter leads always clean, having less trouble with steam traps, keeping dryers from gathering an accumulation of heat-insulating sluge, keeping heating coils free from dirt, keeping small nozzles from plugging up, and keeping impurities from entering dye vats or processes is an extremely important one. In many plants, these regular maintenance items mount up to a large sum in the course of a year. And, practicallly all of it is attributable to the impurities carried away from the boiler with the steam, and consequently can be eliminated by preventing this material from ever reaching the steam line.

How Standard Specification Steam is Obtained

The question as to whether it is possible to have clean steam from a boiler under all load and operating conditions is answered in the affirmative. However, it is no childs'-play to separate boiler water from steam, particularly when that water occurs, as it often does, in the form of very fine mist or fog. In many problems of steam purification, the relation of steam to entrained boiler water, by volume, is 8,000 to 1. The job of seeking out that one particle of moisture from the 8,000 parts of steam, invariably finding the moisture and conducting it away from the boiler, is a real man-sized job.

Such a job requires a steam purifier that is, in the first place, designed according to principles that allow of a possibility of its doing the work. Then, it must be built with the accuracy of a fine watch, otherwise the principles of

separation that it employs cannot be expected to function. The ordinary steam line separator or centrifugal device is of very little value, when absolutely **clean steam** is wanted. Low velocity is the essential factor in steam purification.

To accomplish the savings mentioned as possible through the use of clean steam, it is necessary that the steam be **clean!** Not partly-cleaned. Partial cleaning will not accomplish the desired result. Partially-cleaning the steam to a turbine, for example, will increase the time between necessary shut-downs for reblading. It will not, however, cut down the waste between normal water rate and the high water rate that caused the shut-down.

The degree to which steam must be cleaned is 100 per cent clean. The degree to which steam must be dried is 100 per cent dry. Nothing else will bring the savings that you wish to make.

Definition of Standard Specification Steam

In order to have the quality of steam standardized as other commodities are standardized, certain standard specifications for clean and dry steam have been adopted. They are as follows:

> Steam shall be free from all solids—both soluble and insoluble. Samples of condensed steam shall not show more than nine parts total solids per million, which is the tolerance to cover dissolved copper and iron from the test condenser, unavoidable dust contamination during the collection of the sample and its evaporation and unavoidable errors in the laboratory determination of total solids.
>
> Steam shall be free from all moisture. Throttling calorimeter tests shall at all times show 100 per cent dry steam, + or — not more than 2/10ths of one per cent, based on the determined normal of the calorimeter. The permitted variation of + or — 2/10ths of one per cent is the tolerance for unavoidable variations in radiation and thermodynamic changes.

Millions of Boiler Horsepower Delivered

The question as to whether it is possible to get steam of this high quality commercially is answered by the fact that boilers aggregating more than three million horsepower are continuously delivering Standard Specification Steam. These include twenty-three makes of water tube boilers and practically every kind of horizontal return tubular boiler. All of these boilers are equipped with a certain make of baffle-type steam purifier that assures the continuous delivery of Standard Specification Steam.

These boilers are not in any one locality, but are scattered through the United States, Cuba, Hawaii, and South America. They are in every conceivable type of service, and using every imaginable sort of feed water, treated and untreated.

National Paper Trade Ass'n Meets

At the opening meeting of the National Paper Trade Ass'n at the Congress Hotel, Chicago, the morning of October 25th, Mr. W. N. Gillett, vice-president of the Fine Paper Division, in his introductory remarks sounded a keynote which seemed to prevail throughout the meetings, permanency and expansion. He said in part:

"We appreciate the large attendance at this meeting, and especially the interest of those who have come from a great distance. This is indicative of the growth of the association. Anything that is worth while endures; that which is not, does not endure. The association is an enduring institution. The views of everyone cannot be harmonized, but the officers and committees are anxious to do constructive things. We want new ideas any members have and I can assure you for your officers, that we will spare ourselves nothing to further the interests of this association."

At the morning session, October 26, several members spoke on costs. These addresses dealt with every phase of the cost problem which occurs in a paper merchandising business, tracing net profit from the surplus down to the individual order. The talks were illustrated with stereoptican slides and were very clear and instructive.

During the afternoon session, October 26, the Co-operative Marketing Program recommended by the Marketing Committee was demonstrated to the members. The Marketing Committee's report was adopted by the convention and the chairman authorized to proceed to sell the plan to the individual members, which will necessitate his traveling to practically all of the paper markets throughout the country to present the details of the plan before the members and obtain their support.

Mr. Harry W. Mathewson, vice-president of the Wrapping Paper Division, gave further expression of the growth of the association in his opening remarks at the afternoon session, October 25. He mentioned that a number of non-members were present as invited guests. He welcomed them in behalf of the association and expressed the desire that they join the ranks.

The next meeting of the association will be held at the Waldorf-Astoria Hotel, New York City, February 22, 1928.

Catalogues, Booklets, Etc.

American Blower Co., Detroit, Mich.—The Venturafin method of unit heating is a scientific heating equipment especially designed for factories and industrial plants. The units are made of non-corrosive material throughout, and are simple in construction. The steam coils are of copper and brass, and the tubes of straight, seamless copper tubing. The heat is thrown out by a fan driven by a fully-enclosed industrial type motor, and is distributed over a wide area in any direction desired. A special illustrated booklet just out gives details and specifications, also a number of illustrations of the interior of the Pontiac plant of the Oakland Motor Car Co., in which these units have been installed.

D. O. James Mfg. Co., 1120 W. Monroe St., Chicago, Ill.—This company has just issued catalog No. 133, descriptive of James Generated Continuous-Tooth Herringbone Gears and Speed Reducers. Engineering data, specifications and illustrations of installations are included.

Ajax Flexible Coupling Co., Westfield, N. Y.—A new general bulletin describes the Ajax Industrial Shock Absorber, and sets forth the advantages of the Ajax Rubber Bumper Coupling.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—"Direct Connected Turbine Generator Units—capacities 5, 7½, 10 and 15 kw." is the title of a new leaflet, 2000-D. These units are for 125 and 250 volts DC operation.

Federal Specifications Board, Washington, D. C.—The U. S. Government has issued proposed specifications for tracing and printed drawing paper. Address care Bureau of Standards for copy.

Reliance Electric & Engineering Co., Cleveland, O.—This company has just placed on the market Type AA fully-enclosed, fan-cooled induction motor, with ball bearings, for two and three phase AC circuits. Complete description and illustrations are contained in bulletin No. 102.

The Terry Steam Turbine Co., Hartford, Conn.—A new bulletin, S-84 describes the Terry wheel turbine, which is an especially designed power producing rotor, manufactured from a steel forging without inserted buckets. This is an extremely attractive illustrated catalogue of 40 pages. It is nicely bound with an artistic cover drawing of the turbine in colors. The booklet is printed in two colors throughout, and contains a short history of the company with a full page photograph of Edward Clinton Terry, its first president. The contents include the application of the Terry wheel turbine, its advantages, principle of operation, a detailed description of its parts including the various types of governors, a description of the Terry vertical turbine, and the Terry turbine for high steam pressures; general design features of Terry turbo-generator units, pump drives, blower drives, paper machine drives, pulverizer drives and the Terry gear and shaft coupling.

Bethlehem Steel Co., Bethlehem, Pa.—This company has just sent out a new Catalogue J, which gives complete details on Bethlehem Pulverizers. Details of construction and operation are fully described also tables of materials ground with this equipment are given.

The Month at Washington

PRESIDENT COOLIDGE announces that from data obtained from governmental sources, the business situation appears to be improving and that prospects are encouraging. Some people have been out of work, but reports coming in indicate that employment is increasing throughout the country. Exports have been somewhat larger than last year, with fewer strikes in industry, indicating a more contented condition. On the whole, the country is in a fairly good economic condition.

Tax Reduction—President Coolidge is anxious that taxes shall be reduced at the session of Congress next month, to the fullest extent consistent with an economic administration of governmental expenditures and the curtailment of the national debt which is eighteen billion. The government will have the cost of flood control to consider also.

Program Outlined for next Congress—Congressional leaders of both the House and Senate are arriving in Washington to whip legislative matters into shape for the coming session of the 70th Congress. The outstanding national problems include Mississippi River flood relief, reduction of taxes, farm relief legislation, payment of the national debt, and strengthening of the navy as a result of the failure of the Geneva Conference to limit armaments. A number of bills affecting American industry and commerce, tabled at the last session, will be reintroduced at this session and fought to a finish. The tariff question and commercial aviation will also have attention. The corporation tax reduction program calls for a lowering of the present 13½ per cent rate to at least 11 or 10 per cent, the excise and nuisance taxes are to be repealed, the federal estate tax is under fire, and small corporations are to be given additional relief because of inequality between them and individual taxpayers. Meanwhile, the Joint Committee on Internal Revenue Taxation has been holding meetings to agree upon recommendations respecting administrative features of the revenue laws.

Federal Trade Commission Seeks Additional Powers—The Federal Trade Commission needs more authority to accomplish some of its work of eliminating unfair practices in commerce, says Chairman C. W. Hunt, and to insure nation-wide conformity with a high code of business ethics, beneficial to all concerned. "We need enough government in business to point out the line of demarcation separating law and ethics from illegality and fraud," he says. The commission acts as umpire of unfair methods of competition.

Stabilizing the dollar—A new principle is asserting itself in the realm of monetary science, says Rep. Strong, to the effect that money should have a stable purchasing power continuing all the time, just as there are stable lengths and volumes in measurements. He is a member of the House Committee on Banking and Currency, and author of a bill in Congress to provide for an exhaustive inquiry into how this stabilization can become more effective, which he hopes to push through at this session.

Metric System Again to be Urged—The fight for adoption of a metric system in this country will be resumed at the 70th Congress, says Rep. Britten, author of the bill, "to extend the use of metric weights and measures" and to make it compulsory in the U. S. so as to have a standard system throughout the world.

Advance of Business Due to New Methods—The upward trend of American business since 1921 is attributed to dynamic activity and utmost vigilance in the "key" industries of the country, says Dr. Julius Klein, Director of the Bureau of Foreign & Domestic Commerce. The willingness to accept new ideas as well as to abandon old ones, however deeply rooted, has served to bring modern American business to its highest point of efficiency in history. Unnecessary secrecy has been discarded, business indicators furnished by the government and private associations are more closely watched than ever before, with mass production and mass distribution, waste elimination, speedier communication and transportation the need of the hour, with 30 per cent of the operating revenues of American industry now obtained from foreign business.

Foreign Monopolies Threaten American Business—Since the fundamental business principle in this country is competition, the promotion of the "trust" idea in Europe is threatening the American social, political and economic principle, says the Asst. Att'y General, Wm. J. Donovan, who battles the trust in America. The two diverse policies are coming face to face internationally, he says. European business is consolidating with the complete sanction of the government into trusts which this country rejected a generation ago, and which constitute a real menace to American business today, since in their world-wide expansion they are now setting up agencies in the U. S. With the ability to fix prices and other monopolistic attributes, they harass American business which is forbidden to fix prices or otherwise to mobilize itself as a monopoly. Of course, the Department of Justice is prosecuting every foreign trust which bobbs up in this country, but in a case now pending to enjoin violation of the anti-trust laws against certain foreign monopolies, it is asserted in defence that these monopolies are agents of a sovereign power and are, therefore, immune from prosecution. The Supreme Court has not yet passed on this new menace but a decision may be expected most any day.

Market Research Agencies—A guide to the activities and various publications of both governmental and private agencies, relating to domestic marketing, listing 554 as engaged in some form of market research, has just been issued by the Department of Commerce, entitled "Market Research Agencies" (Series No. 6). All agencies of federal, state and municipal governments, colleges, universities and foundations, and commercial organizations such as advertising agencies, business services, chambers of commerce, co-operative marketing associations, individual businesses, magazines, newspapers and trade associations, are included in this compilation. With this new publication, it is now possible for any organization which contemplates conducting market studies to ascertain just what has been accomplished in any particular field, thus avoiding duplication of effort at great expense. The merchant and manufacturer alike can learn what data is available in connection with the marketing of their particular product or the method of conducting their business, as such functions of business as accounting and budgeting, advertising, cost of doing business, credits and collections, installment selling, inventory methods and store management, have been treated in studies made by these agencies.

Forests and Streamflow—Paper manufacturers will be interested in a booklet entitled, "Forests and Water in the Light of Scientific Investigation," just issued by the U. S. Department of Agriculture, showing how forests play an important part in regulating the streamflow under scientific investigation.

Recent Court Decisions—The U. S. Circuit Court of Appeals (4th Cir.), recently held that liability insurance does not cover workers who are under legal age, and that an insurance company need not pay compensation for injuries to a boy, employed contrary to law and in violation of a state statute. The Campbell Co. had procured the Maryland Casualty Co. (Case No. 2633) to insure it against loss from liability im-

posed by law for damages or death accidentally suffered by an employee, and the policy specifically provided that it did not cover persons who were employed contrary to law.

The U. S. Supreme Court is about to hand down a decision involving the question of federal practice and of the construction of the Federal Uniform Bills of Lading Act in the case of Mueller Co. vs. Amer. State Bank of Omaha, (No. 61).

Board of Tax Appeals Decisions—Certain payments made to employees at Christmas time, were held to represent additional compensation for services rendered, rather than gifts, and where the company paid a part of the vacation expenses of certain of its employees in order to retain their services it was also held that the amounts so paid were deductible as ordinary and necessary business expenses, in McCoy-Brand Co. (No. 10,733).

An inventory taken upon the basis of cost or market, whichever is lower, may not be revised to accord with the market price established subsequent to the inventory date, says the Board of Tax Appeals in a number of cases involving the same point (Docket Nos. 8521-2, etc.).

Certain bonuses paid by a corporation to its president, vice-president and secretary, plus regular salaries and other bonuses thereafter voted, constituted no more than a reasonable compensation for services rendered, says the Board in Rome Co. (No. 8759), allowing the items as proper tax deductions.

An amount collected from an insurance company for loss of machinery and equipment in excess of book values of those items at the time of fire losses, was so invested in new equipment as to require that it be included in income, says the board in another decision (Excelsior-Leader Co., No. 9221). holding that the amount of gain resulting from the collection of fire insurance was taxable as income.

Recent Customs Decisions—Paper classified as wrapping paper at 30 per cent ad valorem under par. 1309 by the collector, was claimed duty free by Geo. Wm. Rueff of New Orleans under par. 1672, and on protest against the collector's assessment the U. S. Customs Court sustained the contention. (189359-G-8305).

Manufacturers of paper classified at 60 per cent under par. 399 were claimed dutiable at 35 per cent under par. 1313 as in chief value of paper by A. C. Williams & Co. of Los Angeles, and the court sustained the claim (204823-G).

A recent tariff controversy was whether certain envelopes were dutiable under the provisions of par. 1308 as plain or decorated envelopes, and it being decided that they were plain and made from plain paper, a duty of 3 cents per pound and 20 per cent ad valorem under par. 1308 was assessed. Lunham & Reeve, Inc., N. Y. (No. 168021-G).

Interstate Commerce Rulings—Proposed increased rates on newsprint paper and wall paper, blank, unfinished, in carloads, from Canadian points to Iowa destinations, were found not justified by the Interstate Commerce Commission except as applicable over the Chicago, Burlington & Quincy, in Suspension Docket No. 2819.

Rates on finished wall paper, in carloads, from various points of origin in Illinois, Missouri, New York, and Pennsylvania, to Dallas and Fort Worth, Tex., via all-rail, rail-water and rail, and water and rail routes, were found not unreasonable in the case of Apex Co. vs. Ala. & Vicksburg R. R., (No. 17612), and the case was dismissed.

The initial carrier was found not guilty of misrouting less-than-carload shipments of various kinds of paper shipped from Watertown, New Hartford, and Brownsville, N. Y., to Lynchburg, Va., because its agent could not reasonably be expected to have knowledge of the distant component that resulted in the lower combination rate in Chamber of Commerce of Lynchburg vs. N. Y. Central (No. 17,465).

By an order just entered on Suspension Docket No. 2985, the operation of certain schedules of freight rates on cars of paper boards are suspended until May 1, 1928. The suspended schedules propose changes in rates on paper boards, carloads, between points in Western Trunk Line territory, resulting generally in increases.

Suspension Docket 2996 proposes to restrict rates on wood pulp board from Minnesota, Illinois, and Missouri, but to make them nonapplicable to the Penna. R. R. and certain other carriers operating through Indiana.

Distribution Census—The Bureau of the Census has released complete statistical data about its sales census of the distribution of commodities for Springfield, Ill., Atlanta, Ga., Kansas City, Mo., and Seattle, Wash., with the remaining reports due this month and scheduled for release covering Chicago, San Francisco, Providence, R. I., and probably Kansas City, Kans.

The reports released show the following outlets for paper and paper goods in the cities named, viz:

City	No. of establishments	Inventory Dec. 31, 1926	Sales 1926
Springfield, Ill.	7	23,100	$ 115,200
Atlanta, Ga.*	29	221,300	1,723,500
Kansas City, Mo.*	46	510,000	2,162,000
Seattle, Wash.	4	17,900	177,800

* In these cities "paper and paper goods" are not shown separately, but combined under the heading of "stationery". Copies of these reports, and those to be released during the month, may be obtained for study and analysis, upon application to the Census Bureau.

Improved Test for Paper—Oxidation products, if present in paper, weaken it so that it is desirable to keep them as low as possible. An improved method for determining the amount of these products has been developed by the Bureau of Standards and published in Technologic Paper No. 354, just issued, giving a complete description of the bureau's research into the problem, "A Modified Method for Determination of the Copper Number of Paper," by B. W. Scribner and W. R. Brode.

Finnish Government to Construct Pulp Factory—The Finnish government is proposing to construct a cellulose factory at Veitsiluoto, in Northern Finland, where it owns a large saw mill, at a cost of 60 million marks (approximately $1,511,355)

France Regulates Foreign Salesmen—Modifications have been made in the French law of Oct. 8, 1919, establishing conditions under which cards of identity may be issued to representatives of commercial organizations traveling in France, complete details of which may be obtained from the Department of Commerce by interested parties.

Treasury Department Wants Tariff Changes—The House Committee on Ways and Means has been asked by the Treasury Department for certain changes in the administrative provisions of the Tariff Act of 1922, including elimination of cost of production standard of fixing values, limitation on the privilege of amending entry, abolition of the power to embargo the product of foreign producers who refuse to allow customs officials access to their books, summary forfeiture of all seizures, and increased qualifications for the licensing of customs house brokers.

Invoice Basis for Cost—According to a recent ruling of the Attorney General, invoice prices may be taken as evidence of foreign cost of production. This decision will expedite cost of production investigations being conducted by the U. S. Tariff Commission, since the decision says it is not necessary to send specialists abroad when foreign cost data is obtainable in this country. The commission claimed that actual book costs of a foreign manufacturer are more accurate than invoice prices. The decision removes a great barrier in conducting cost inquiries.

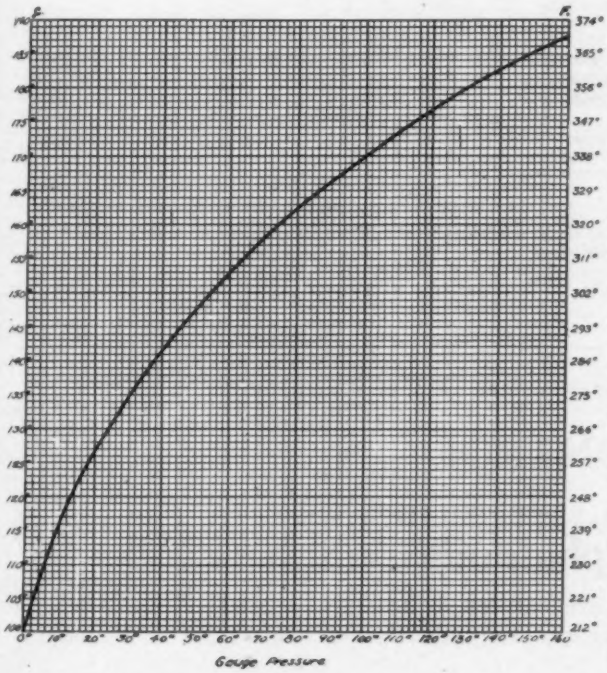
Increase in Gulf of Mexico & Caribbean Sea Trade—There has been a great increase in American trade with the countries of the Gulf of Mexico and the Caribbean Sea, which is now reaching the billion dollar mark. With 42 million inhabitants in this region, 13 per cent of our total exports now reach those countries, and with proper sales efforts sales can be gradually increased, says Dr. Julius Klein, due to improved standards of living, more stable political conditions, and further development of unexploited raw materials, all of which increase the per capita buying power in those markets.

Trade Promotion Fairs—Because of the fact that the old-fashioned European fairs have regained their former importance as trade promotion agencies, the Department of Commerce has issued a calendar of fairs already held and those scheduled for next year in different countries of the world. Copies of the circular are available upon application to the Specialties Division.

Practical Helps for the Mill Man

Temperature-Pressure Curve

A TEMPERATURE-PRESSURE curve when dealing with steam is often of great convenience and a time saver. The curve registered on the chart permits readings from 0° lbs. pressure or 100° C. and 212° F. to 160 lbs. pressure or 190° C. and 374° F. To obtain the temperature for any given



pressure, it is simply necessary to locate the point on the vertical line registering the given pressure where the curve intersects, and then to follow the horizontal line from this point to either side for the temperature reading, this depending upon whether the reading is desired in Centigrade or Fahrenheit. To find the pressure for any given temperature, it is simply necessary to reverse the process.

Weight of Pulpstone

TO APPROXIMATE the weight of a natural pulpstone, it is simply necessary to square the diameter of the stone in inches, multiply this figure by the thickness or face of the stone in inches, and the resultant by .06363. Repeat the same calculation for the eye of the stone, that is, square the diameter of the eye in inches, multiply this figure by the face of the stone in inches, and the resultant by .06363. Subtract this last figure from the first completed calculation and the result is equal to the approximate weight of the pulpstone. For example: The weight of a pulpstone 54" in diameter with a 27" face and an eye approximately 10" face and an eye approximately 10" in diameter would be determined as follows:

$54^2 \times 27 \times .06363 = 5010$
$10^2 \times 27 \times .06363 = 172$
$5010 - 172 = 4838$ lbs. = weight of stone

Old Felts for Couch Rolls

A BOARDMILL superintendent has devised a novel method of covering the couch rolls of a cylinder machine. Instead of attaching the felt in the usual manner, he has found it advantageous to cut old wet end top and bottom felts into strips about three or four inches wide, each strip being of a length when wound into a fairly tight roll (as a roll of belting) to form a roll about three inches in diameter. A sufficient number of these rolls are prepared to cover the couch roll face when each roll is attached, or toe-nailed through one end of the roll to the couch face with every roll packed closely to its neighbor. It is the same as fastening a series of cylinders to the couch roll face, each cylinder being attached to the face of the roll through one end rather than on the face side. With the couch completely covered with the cylinders, the roll is then placed in a lathe and the felt face machined. Such a roll has given excellent service and satisfaction.

Weights of Materials in Pounds per Cubic Foot

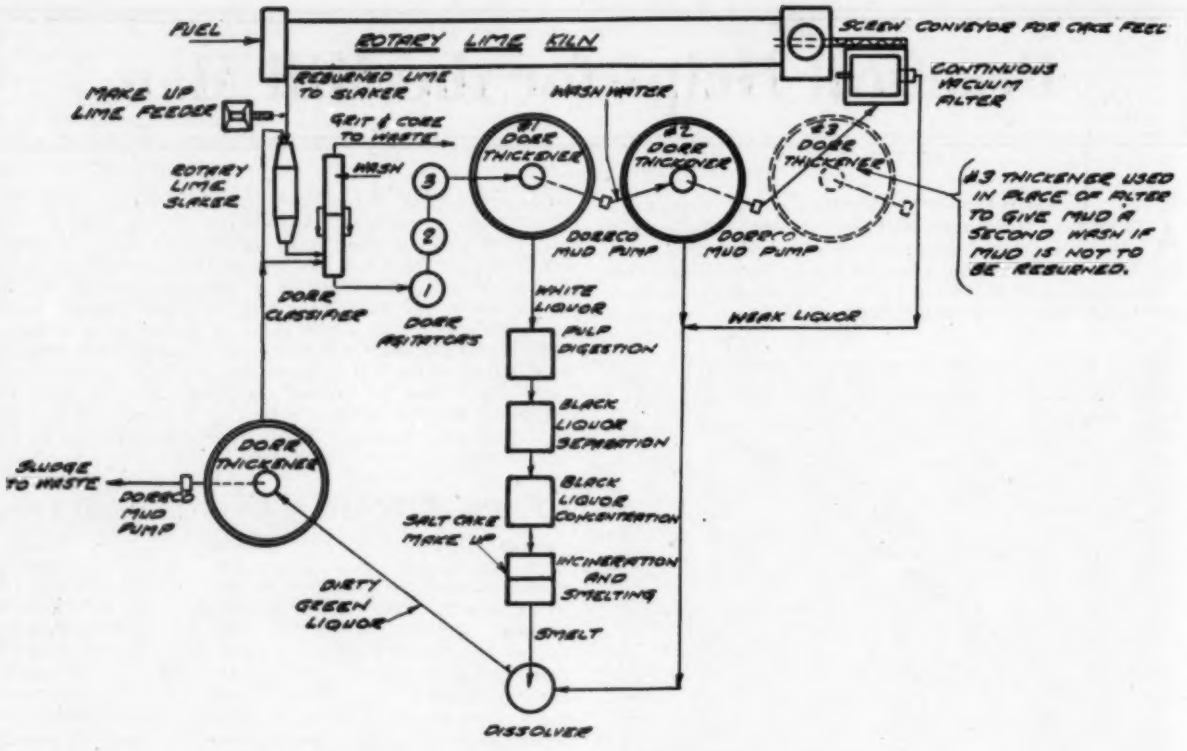
Metals	Weight per Cubic Foot Average	Specific Gravity Average
Aluminum (cast)	166	2.67
Babbitt Metal	456	....
Brass, cast	524	8.4
Bronze	534	8.56
Copper, cast	537	8.61
Iron, cast gray	450	7.21
Iron, wrought	485	7.78
Lead, Commercial	710	11.4
Monel, (rolled)	556	8.95
Nickel	537	8.8
Steel	490	7.85
Tin, cast	455	7.29
Zinc	437	7.

Material	Weight per Cubic Foot Average	Specific Gravity Average
Asphalt	87	1.4
Barium sulphate (barytes)	281	4.5
Bleaching powder	45–52	....
Charcoal	18–18.5	....
Clay	137	1.92–2.4
Coal—anthracite broken	55–66	....
bituminous broken	50–55	....
Lime, quick	53	.843
Limestone	168	2.7
Paper	58	.70–1.15
Pyrites	318	4.8
Rosin	....	....
Salt	48	.77
Salt Cake	87.5	1.4
Soda Ash	156	2.5
Sodium Hydroxide	131	2.1
Starch	96	1.53
Sulphur	125	2.
Sulphur (lump)	90	....
Talc (soapstone)	169	2.7

Rhoads Leather Belts Now Made Waterproof

J. E. Rhoads & Sons, manufacturers of leather belting, announce that they are now making all their regular brands of belting with waterproof cement and a treatment to make the leather water-resisting. This makes it possible to use their leather belts under either dry or wet conditions. They have adopted this change only after long-continued experiment and thorough test.

This waterproof method of manufacture insures a belt adapted to wet places; the treatment increases the already superior grip, and the waterproof cement makes a stronger belt. The belts are being used with great success in paper and pulp mills.



ONLY 2 POINTS OF CONTROL—

In this continuous recausticizing plant for sulphate mills.

Flexibility of operation and ease of control are features of the Dorr Continuous recausticizing system that appeal to practical paper men.

In the sulphate mill layout illustrated, two adjustments, regulated according to the amount of green liquor entering the system, control the whole operation.

1. Adjustment of wash water flowing to the last Thickener in the series.
2. Addition of make-up lime.

Results can be kept uniform, and, compared with intermittent methods, operating costs are singularly low.

With modifications to meet the particular conditions involved, the Dorr System is operating successfully in Soda Pulp Mills.

DORRCO

The mark of Dorr Service

{Write for Bulletin No. 16 and special data on recausticizing in the Pulp & Paper Industry.}

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INVESTIGATION TESTS DESIGN EQUIPMENT

Newsprint Paper Manufacturers Hold Meeting

Conditions of Business Discussed After Hearing Report on Production and Distribution, Imports and Exports of Paper and New Machines

THE News Print Service Bureau, an international organization for the collection of statistics bearing on the manufacture and distribution of newsprint paper in North America, held its annual fall meeting in New York at the Hotel Commodore, on Wednesday, Oct. 19. The Bureau maintains headquarters at 342 Madison Ave., New York City, and is officered as follows: president, Louis Block, president Crown-Williamette Paper Company, San Francisco, Cal.; vice-president, F. J. Campbell, general manager, Canada Paper Company, Ltd., Windsor Mills, P. Q., Canada; secretary-treasurer, R. S. Kellogg, 342 Madison Ave., New York City; executive committee, Percy B. Wilson, vice-president, Spanish River Pulp and Paper Mills Ltd., Saulte Ste. Marie, Ont., Canada; J. Leonard Apedaile, managing director, Price Bros. & Co., Ltd., Quebec, Canada, and A. R. Graustein, president, International Paper Company, New York, N. Y.

The program included the presentation of reports on newsprint production, shipments and stocks; imports of overseas paper, newsprint consumption and publishers' stocks; volume of advertising, and new machines 1927-1928, as well as a review of general conditions throughout the industry; but reports on these aspects of production and commerce were considered in executive session.

Speakers at Luncheon

The luncheon meeting which took place in the afternoon was attended by fifty persons, including some of the more prominent Canadian and United States paper manufacturers, guests and the representatives of paper industry periodicals. At the close of the luncheon addresses were made by J. Wright Brown, publisher of Editor and Publisher, New York City; P. H. Whaley, of the Whaley-Eaton Service, Washington, D. C.; Col. George Roth, of the Harvard Committee on Economic Research, and Byron W. Holt, of Goodbody & Co., New York City.

Newspaper Advertising and Circulation

Mr. Brown said that while the volume of national advertising had increased to some extent during 1926, a net loss of 4 per cent was reported in total volume and this was traced to the classified columns. Nearly every advertising medium in the country showed great losses in classified advertising, though national advertising as a whole had maintained a gratifyingly high level. There was one exception—automobile advertising. But conditions in this field reflected the uncertainty concerning a new make of automobile which was to be launched by the Ford Co. Some complaint was beginning to be heard from merchants and manufacturing concerns of the tendency to consolidation and concentration of newspapers in the larger cities and pressure had been exerted in some instances on independent publishers to start vehicles of protest.

In regard to newspaper circulation he said that a 4 per cent annual increase represented normal growth, but many conservative newspapers had registered increases of 5, 10, and 15 per cent over the figures for the previous year, and one newspaper was credited with 100 per cent increase. An interrogation by a member of the group brought out the fact that it was the New York Evening Post which had registered this remarkable increase. Nothing was said about the conditions surrounding the increase, but it was well known to all present that the price of the Evening Post had been reduced during the year from five cents to three cents. In response to another question, Mr. Brown said there had been no special effort made to force the growth of circulation by general newspapers during the year, the growth of circulation having been stimulated by an unusual number of great news events. Newspaper publishers were no longer indulging in premium schemes for swelling circulation. He mentioned the A. B. C. as a stabilizing factor in determining accurate circulation figures. It was noted that there was a tendency toward the elimination of returns by metropolitan newspapers. In reply to a query, he gave it as his opinion that advertising by means of radio announcements of an entertaining character over the radio had rather stimulated newspaper advertising than otherwise. In regard to the size of newspapers, it was mentioned by Mr. Kellogg that Sunday issues had been reduced in bulk about 3 per cent, but that the dailies had maintained an even level, with, in special instances, an increase of paper consumption.

Production Ahead of Consumption

P. H. Whaley, of the Whaley-Eaton Service, Washington, D. C., gave a most diverting account of financial and economical conditions as reflected by affairs at the national capitol. He illustrated present tendencies by telling the story of a little pickanniny who was found with a half-consumed watermelon on his lap, perspiring freely and apparently at the limit of exertion in attempting to dispose of the watermelon. "Too much watermelon?" a bystander asked. "No, boss, not enough pickanniny." This, Mr. Whaley said applied to present conditions in industry—too much production and not enough consumption. While he thought that politics might be a disturbing factor in business next year, he considered it would be slight as compared with previous national election years.

The United States, he went on to say, was at the beginning of a great period of national building. In its comparatively short period of national existence as compared with the centuries and centuries of European development, our country had shown tremendous progress. For it should be remembered, said he, that if Augustus had found Rome brick and left it marble, we began with a frontier.

Business Outlook Is Good

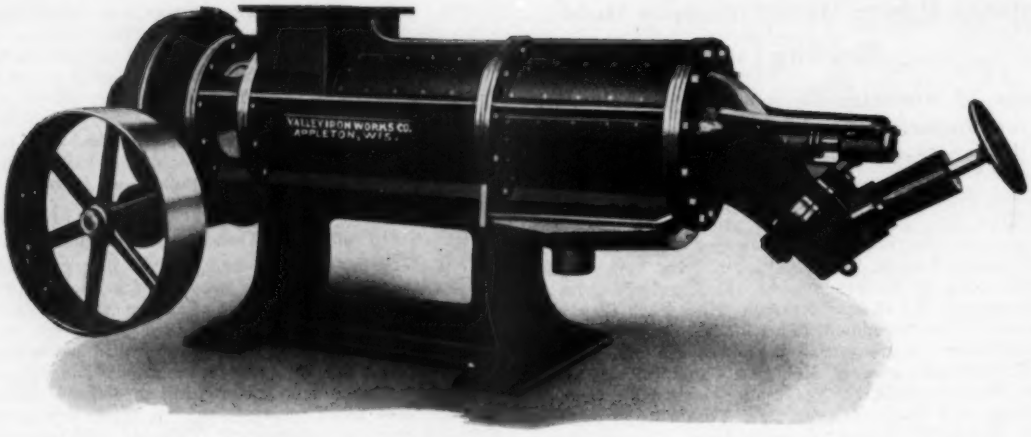
Byron W. Holt, of Goodbody & Co., New York City, emphasized present conditions as indicative of a consumptive capacity inadequate to absorb production, but he said that prices of corn and cattle would continue high and there was no fear of any decline in values or a bar to business prosperity.

Col. George Roth, of the Harvard University Committee on Economic Research, compared the position of the United States as a creditor nation with that of Great Britain at the close of the Napoleonic wars. He said that 1929 might be the year which would decide whether European nations would pay their debts and continue to operate under the Dawes plan. As to the year ahead, nothing was visible that was calculated to bring about any great disturbance of business or affect the stock market adversely.

Plea for a New Calendar

In closing the proceedings of the luncheon meeting, Mr. Kellogg said he was optimistic regarding future conditions, but as he had demonstrated at an earlier sitting, there was a need during 1928 for the use of something like 100,000 tons of newsprint paper if consumption was to keep pace with production. He called attention to the movement instituted by George Eastman for the adoption of the international fixed calendar, providing for thirteen 4-week periods in the year, as devised by Moses B. Cotsworth. This, he said, marked the beginning of a systematic effort to bring about one of the most important reforms in business, one which would afford a means of overcoming defects in the present calendar that would mean much to accountants alone in avoiding confusion of dates.

Hugh J. Chisholm, W. L. Carter, J. P. Hummel, Milton E. Marcuse, Felix Pagenstecher, S. L. Wilson and Norman W. Wilson, members of the Executive Committee of the American Paper and Pulp Ass'n, met with President Everest and Secretary Baker in New York on November 9, to consider the secretary's report on the association's activities during the past six months and to plan for the industry's annual convention next February. Dr. Baker's report indicated that the association was working aggressively in the interests of the industry along a well-defined program and giving effective direct service to its members.



The VOITH SCREW PRESS is a *Space-Labor and Power Saver*

Efficient and dependable in performance and inexpensive in upkeep, the Voith Screw Press has overcome the drawback of other machines for dewatering pulp. With it ground wood pulp having a density of 6-7% can be brought up to 30-35%. Chemical pulp can be fed to the press with as low as 2-3% and be brought to a density of 45-50%.

And, this is accomplished with no upkeep for felts and wires, low initial cost, small labor and power requirements. The Voith Screw Press is the result of careful study and extensive tests. It pays for itself through the savings it makes.

Let us show you why the Voith Screw Press is an investment.

Write *today* for pamphlet describing the Voith Screw Press.

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

APPLETON WISCONSIN

New York Office: 350 Madison Avenue
Western Manufacturing & Sales Division, Smith & Valley Iron Works Co., Portland, Oregon

Kalamazoo Valley Cost and Technical Association Meets

The Cost and Technical Association of Paper Industry, Kalamazoo Valley Local Division, was the guest of the Postum Company of Battle Creek on October 26, 1927. The members were given the privileges of the club house which is a very elaborate one. An opportunity was also given to visit the office of the late C. W. Post, the furnishings of which remain as he left them. The club room on the second floor contains a large number of beautiful and famous paintings. On the first floor there is a ball room for the benefit of the employees. Following the much enjoyed dinner which was served in the cafeteria in the basement of the building, the members of the association adjourned to one of the rooms on the second floor where the program was given.

Mr. J. W. Barrett, C. P. A., of the Kellogg Company of Battle Creek was the first speaker. Mr. Barrett's ability as an interesting and entertaining speaker is well known to the members for this is the third time he has been invited to address the association. His subject was "Cost Accounting and Its Relation to Management."

Mr. Barrett brought out the fact that until recently it was thought advisable to withhold cost information from the foremen and factory superintendents. Now, this information is considered as a guide in assisting them to reduce waste and increase efficiency. He clearly illustrated this by comparing the need the foremen have for these figures to the need Col. Lindbergh had for his various instruments in flying from continent to continent. In the past, factory superintendents have not been interested in detailed information, but preferred to work out their own figures from the labor and burden. The results were often as incorrect as the results of a cost system which is not tied-in by the general books.

Mr Barrett favors a standard cost system tied-in with the general books. In using this system the differences from the actual cost is very plainly seen in all departments, and also in the material costs. Superintendents are beginning to be well pleased with the results.

In his other addresses before the association, Mr. Barrett gave some general data regarding a standard cost system. At this meeting, however, he presented a hypothetical case of the XXX Carton Company, and figures showing differences were given as follows:

XXX Cartons

Standard Weight per 100 Cartons x Standard Cost per Pound—Standard Cost of Paper—Gross	$4.70
Standard Salvage Credit for Waste Paper Sold	.03
Net Paper Cost per 1000 Cartons	$4.67
Red Ink	$ .06
Dark Green Ink	.07
Light Green Ink	.10
Total Material Cost per 1000 Cartoons	$4.90
Add Allowance for Spoilage on Press 1.5%	$ .08
Printing Plate Charge	.02
Productive Labor—Press Group	.25
Burden	.25
Total Cost (Through Press)	$5.50
Productive Labor—Stripping	$ .04
Burden	.01
Total Cost (Through Strippers)	$5.55
Glue	$ .01
Productive Labor —Glue Machine	.10
Burden	.09
	$5.75
Add Allowance for Spoilage on Glue Machine .5%	$ .03
Total Cost—1000 Cartons	$5.75

Differences between

(a) Actual weight of paper used and standard weight of paper is variance due to excessive waste or vice versa.

(b) Total cost of paper used and cost of actual quantity computed at standard cost is variance due to purchase price.

(c) Actual weight of waste paper salvaged and standard weight of salvage is variance due to greater or less waste salvaged.

(d) Actual value of waste paper salvaged and actual quantity of salvaged computed at standard value is variance due to sales value of waste paper.

(e) Actual machine hours and standard machine hours is variance due to department efficiency.

(f) Actual labor and actual machine hours computed at standard machine rate is variance due to changes in labor rates or number of men per machine.

(g) Actual burden and standard burden is variance in departmental Burden.

(h) Standard Burden and Actual production quantity multiplied by standard burden rate is variance due to increased or decreased production.

The standard cost system is made up for the whole year without change, unless new equipment is installed or something unusual occurs. This system brings out the variances between the actual and the standard costs. He concluded his address by saying that it was not so much the thing that goes right but the thing that goes wrong that should be of utmost interest.

Following Mr. Barrett's address, the Consumers Power Company of Michigan provided several reels of moving pictures, which showed the locations of their various hydro-electric power plants, with views of the surrounding country as well as the interior of some of the plants.

Mr. W. S. Sooy, vice-president and manager of the Michigan Carton Co., then addressed the association on the subject of "Power Plant and Its Relation to the Finished Product." He gave some interesting figures showing what percentage the power cost is of the total cost of production. He pointed out the necessity of attention to minor details, such as frequent testing of coal and so forth. He illustrated his point by relating a case where coal coming from the same mine which had previously produced a good grade of coal having a B. t. u. of 14,000, was found to have a B. t. u. of only 12,000, because of the exploitation of a different vein of coal. Mr. Sooy gave many other interesting details regarding power plants.

Canadian General Electric Company Host to Papermakers

Pulp and paper specialists from plants of the Canadian General Electric Company and the parent concern in the United States, together with paper mill superintendents and those in charge of power and electrical equipment in various pulp and paper plants throughout Canada, met in annual convention at the King Edward Hotel, Toronto, on October 13th and 14th, and as guests of the big Toronto plant discussed and exchanged ideas on various problems connected with the power that drives papermaking machinery.

The meeting was the third annual gathering of the kind, two previous meetings having been held in Toronto and the other at Schenectady, N. Y., where the huge General Electric Company plant is located. That organization sent to Toronto for this year's meeting, H. W. Rogers, of the industrial engineering department of the company who, by the aid of lantern slides dealt with paper machine power requirements and the proper selection of motors in graphic style, while "Synchronous and Induction Motors and Control Applications" was handled by A. B. Gates, general engineer of the C. G. E., at Toronto, N. D. Paine described the electrical experiences at Price Bros & Co., Ltd., as general electric superintendent of that company's big Canadian plants, while B. Malkin, assistant chief engineer of the Dominion Engineering Works, Limited, Montreal, gave the gathering an excellent paper dealing with recent developments in paper making machinery, S. E. M. Henderson, switchboard engineer of the Toronto plants of the C. G. E., described a switchboard layout of a 500-ton paper mill in a carefully prepared paper, and this and other papers and, addresses gave rise to considerable discussion of a technical nature.

The General Electric Company, both in Canada and the United States has been making great strides in the development of electrical machinery for the pulp and paper industry

The ECONOMY *of* WOOD ROSIN SIZE *in* *PAPER MAKING*

AN increasing number of paper manufacturers are substituting Wood Rosin Size for the commoner grades of gum size. This practice is influenced by distinct advantages.

Size made from Kalbfleisch Wood Rosin is entirely satisfactory for stocks where light or white color is not essential; as a general rule all unbleached stocks may be sized satisfactorily with wood size.

THERE is a difference in price in favor of Wood Rosin Size. It is always quoted at less than the commoner grades of gum—and it is a stable price in contrast with the latter.

Kalbfleisch Wood Rosin Size should appeal therefore to many paper manufacturers who are now using high priced gums.

for PAPER

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and the interchange of ideas as to the technical construction and operation of the various types of electrical units proved well worth while to the large number of experts in attendance. Two welcome contributors to the program, although not officially on it were Mr. Cameron, of the Cameron Machine Company, Brooklyn, N. Y., W. W. Cronkhite, of the commercial industrial department of the American plant, and Mr. Wooley, of the Bailey Meter Company, Cleveland and Montreal.

The gathering was presided over by R. W. Leeper, manager of the pulp and paper department of the Canadian General Electric Company, Toronto, and he and his committee were responsible for some splendid entertainment as well as for the peppy business sessions. J. J. Ashworth, general manager of the plant in Toronto, was on hand to extend an official welcome to the delegates on behalf of the executives of the company and those engaged in the manufacture of electrical power devices for the pulp and paper industry. Mr. Ashworth took occasion to point out that Canada was now the greatest producer of newsprint in the world and that country was the possessor of unlimited water power which was so necessary to the economical manufacture of pulp and paper. "The forest and water power of Canada we consider among our greatest national assets and these combined with the great pulp and paper industry should suggest to us the wisdom of bending every effort to see that operations are carried on economically so that every horsepower is made to produce the greatest amount of finished products," said Mr. Ashworth, who pointed out that while Canada was the greatest newsprint producer in the world, she was also equipped by her many mills to turn out other lines of paper, equal in many cases to the product manufactured in other countries. "If we can by co-operative effort in design and application of all electrical devices used in the manufacture of pulp and paper speed up production as the product passes from the forest to the mill, we will be making a great contribution to the pulp and paper industry as a whole," said Mr. Ashworth.

As a practical demonstration of what is being done in the Toronto plant of the Canadian General Electric Company, the entire delegation was taken down to the Lansdown works on Thursday afternoon where, under the guidance of Charles E. Sisson, transformer engineer, they were shown the workings of the huge foundry where work is about to be started on a 115-ton transformer for the International Paper Company in the Gatineau Valley. Incidentally, the visitors were informed that the Canadian Pacific Railway has already begun the construction of a special type of flat car, weighing 85,000 pounds, for the transportation of this huge transformer, which is the largest ever built in Canada, and one of the largest on the continent. The company is also engaged in the setting up of a number of penstocks for shipment to various pulp and paper mills throughout Canada, one of them being destined for one of the big mills in British Columbia. The Canadian General Electric also operates a large plant on Dufferin Street, and the visitors also had the opportunity of visiting the works and viewing the processes by which electric light bulbs, from the small flash light to the big street lamp, are manufactured.

Elaborate preparations had been made for the entertainment of the guests, the arrangements including luncheons at the King Edward Hotel, a banquet at the Engineers' Club and golf and dinner at the Mississaugua Club, one of Toronto's exclusive golf links.

Paper Mills Exhibit at D. M. A. A. Convention

Among the most interesting of the exhibits at the Direct Mail Advertisers' Association, held at the Hotel Stevens, Chicago, October 19 to 21, were those of a number of prominent paper mills. For the most part the mills exhibited their various lines in the form of printed specimens. Letterheads, posters, show cards, folders, blotters, sample sheets from magazines and newspapers were shown to illustrate the uses of the many papers. These exhibits were viewed with a great deal of interest by the visiting members.

Some of the mills having space at the exhibit were: Albemarle Paper Mfg. Co., Richmond, Va., with a striking electrically lighted display illustrating their various colored blotters; Appleton Coated Paper Co., Appleton, Wis., exhibited their Direct Sales Bond coated on one side; The Beckett Paper Co., Hamilton, Ohio, had a striking display of specimen cover papers; Dill & Collins Co., Philadelphia, Pa., had an illustrative display of coated papers in many weights; District of Columbia Paper Mfg. Co., Washington, D. C., calling themselves "The most colorful paper mill in America," showed a variety of covers and blotting papers in a wide range of colors; Eastern Mfg. Co., Bangor, Me., had a large exhibit of their Atlantic Bond with a number of printed specimens; Falulah Paper Co., Fitchburg, Mass., attracted wide interest with a display of card boards in the form of car signs, window cards, etc.; Hammermill Paper Co., Erie, Pa., in addition to a complete showing of various office forms printed on their papers, had an interesting photo exhibit depicting different steps in the manufacture of paper; Hampshire Paper Co., Inc., South Hadley Falls, Mass., showed their Old Hampshire Bond in a variety of forms and in box stationeries; Kimberly-Clark Co., Inc., Neenah, Wis., had an inclusive exhibit of Rotoplate for rotogravure printing, displaying sample sheets from magazines and newspapers, folders, etc.; Standard Paper Mfg. Co., Richmond, Va., showed their Standard Offset and Two Text papers, together with a large display of blotting papers; Strathmore Paper Co., Mittineague, Mass., had a very interesting exhibit of colored papers and papers for use in direct mail advertising; S. D. Warren Co., Cumberland Mills, Me., featured papers for booklets and the many uses of booklets in advertising; Worthy Paper Co. Association, Mittineague, Mass., displayed high grade book and writings; Wrenn Paper Co., Middletown, Ohio, had a complete exhibit of blotters for use in direct mail advertising.

There were also a number of nationally known paper merchants exhibiting at the meeting. Some of these were: Butler Paper Co., Bermingham & Prosses, McLaurin-Jones Co., Seaman Paper Co., Swigart Paper Co., and Whitaker Paper Co.

Foote Bros. Acquires Business of A. Plamondon Mfg. Co.

The recent purchase of the A. Plamondon Mfg. Co. by Foote Bros. Gear & Machine Co., merges two of Chicago's pioneer industrial firms which have grown and expanded side by side, with a history extending back into the early days.

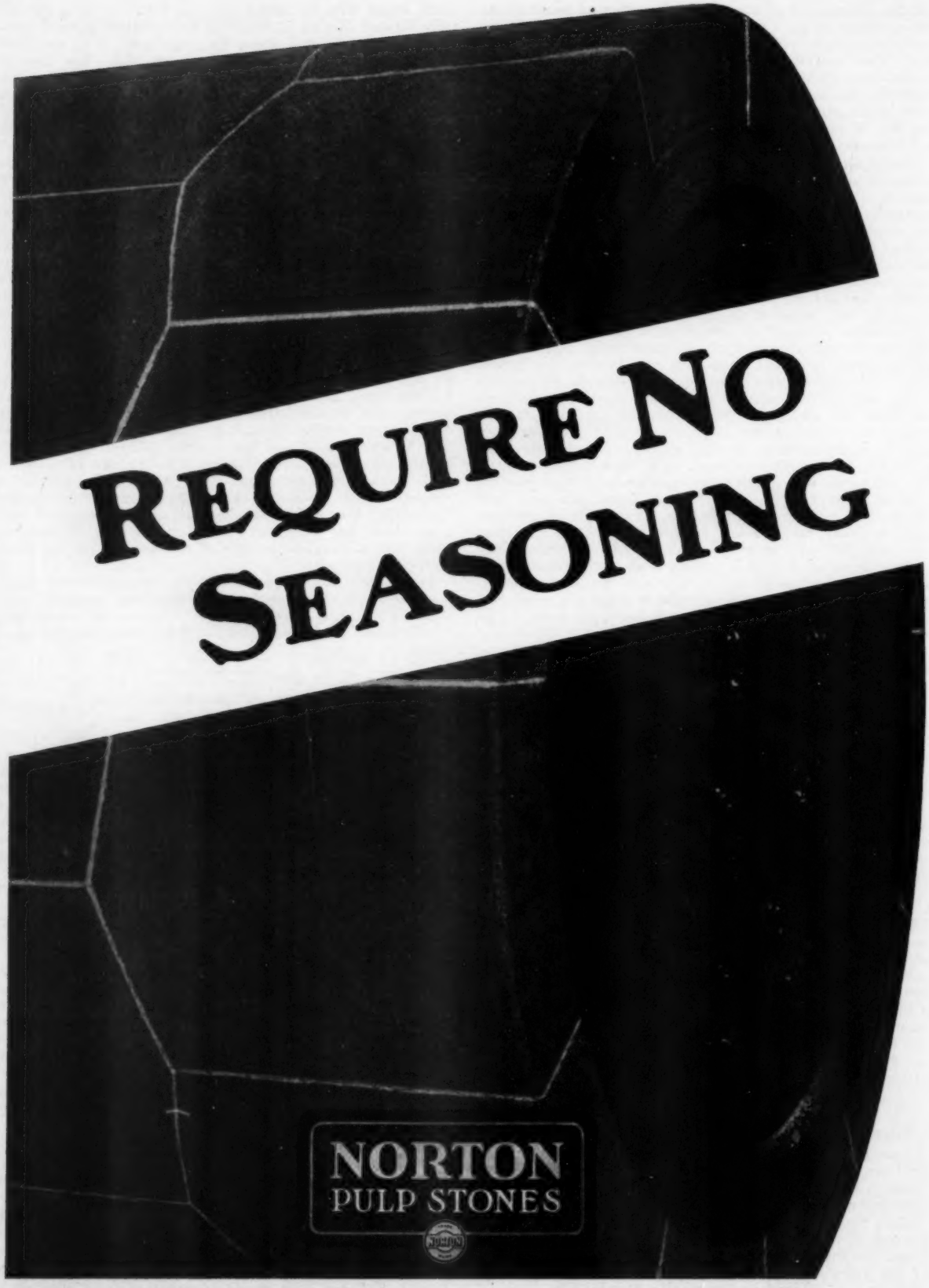
The A. Plamondon Mfg. Co. is the older of the two firms, having been organized in 1859 by Ambrose Plamondon, and for nearly seventy years this business has been carried on by members of his family. An interesting side light from these early days is found in the fact that in the early '80's, when John B. Foote began to think of going into the machinery business for himself, Ambrose Plamondon was the first man to whom he turned for advice and financial assistance, both of which were freely given. Thus began the friendship of the founders of the two companies now merged as one.

Both the Foote Bros. Gear & Machine Co. and the A. Plamondon Mfg. Co. have ranked among the largest and most important concerns of their kind in the country, and have gained an international reputation in the manufacture of gearing and power transmitting machinery. By this consolidation, Foote Bros. now claim to be the largest manufacturers of gearing and speed reducers in the world.

The personnel of both organizations will be retained and the Plamondon plant operated as in the past.

The U. S. Stoneware Co., of Akron, O., manufacturers of U. S. Standard Acid Proof Chemical Stoneware, have acquired the plant formerly occupied by The Acid Proof Clay Products Co. at Tallmadge, Ohio. Officials of the U. S. Stoneware Co. are, Franks S. Wills, president; John J. Chamberlain, general manager and S. H. Farkas, sales manager.

Ralph F. Freeman, formerly production manager of the Insulite Co., has been appointed assistant superintendent of the Stewart Inso Board Co., of St. Joseph, Mo.



NORTON COMPANY, WORCESTER, MASS., Norton Company of Canada, Ltd., Hamilton, Ontario

Canadian News

Epoch-Marking Ceremony at Montreal

On October 11th the Hon. James A. Robb, federal Minister of Finance, laid the cornerstone of the new Institute of Cellulose, which is being constructed by the Canadian Pulp and Paper Ass'n on the McGill campus, in Montreal, and in which fundamental scientific and industrial research on cellulose technology will be carried out jointly by McGill University, the Canadian Pulp and Paper Ass'n and the Dominion Government. Professors of the various departments of the University, in their academic robes, and representatives of the association whose foresight has made possible the establishment of the Institute, made the ceremony a colorful one.

The Hon. Mr. Robb, while making no definite promises, made it clear that the federal government is quite prepared to contribute in large measure to the development of industrial research. As he put it, he did not like to make commitments of any kind, but "the government will do no less next year than it did last year." Sir Arthur Currie, Principal of McGill University, and Col. C. H. L. Jones, chairman of the Research Section of the Ass'n, contributed to the ceremony and paid tribute to the late Mrs. E. B. Eddy, whose bequest of $200,000 made the building possible.

The ceremony was followed by a luncheon at which Dr. H. M. Tory, honorary president of the Advisory Council for Scientific and Industrial Research for Canada, and president of the University of Alberta, was the speaker. He expressed the hope that the example set by the Canadian pulp and paper industry in providing facilities for scientific research would be followed by other Canadian industries, adding that he believed "that if we approached the problems of our industry generally, as you have approached yours, that in less than a generation we will add to our resources the equivalent of the national debt."

Rapid progress is being made with the construction of the new building, and it would not be surprising if the 1928 annual meeting of the Canadian Pulp and Paper Ass'n were held in the association's new quarters.

In reply to the allegation of Pilsener Beer, Ltd., reported in these columns last month, E. Newell, president of Dominion Envelope and Carton Co., Toronto, declared that in 1926 not a waxed paper company made a nickel, and that his own organization lost from 10 to 15 per cent on the business in that product. A reduction to 15 per cent in the present customs duty on waxed paper was asked and Mr. Newell claims that if this is granted it will practically close up every waxed paper plant in Canada.

The capacity of newsprint production in Canadian paper mills shows an increase of 18 new paper machines, and an increased daily capacity of 1865 tons by the end of 1927. Up to the present time sixteen new machines with a total daily capacity of 1665 tons have been placed in operation this year. In 1926 the mills added 14 new machines with an aggregate capacity of 1315 tons a day. Latest available figures give the rated capacity of the Canadian newsprint mills at 8420 tons a day, as compared with 5992 for United States mills and 735 tons for Newfoundland and Mexico.

According to A. R. Graustein, president of International Paper Co., "Canada has the world by the tail insofar as the newsprint industry is concerned." He feels that fear of foreign competition in this field is groundless. Newsprint production in the United States is decreasing and the most important American companies are moving their plants north of the border. Mr. Graustein emphatically denied the rumors that have been circulated to the effect that his company was negotiating to acquire control of the E. B. Eddy Co., of Hull, Que., from the Hon. R. B. Bennett, newly-elected leader of the Conservative party. Rumors to that effect he attributed to the fact that the plants of the two companies are in close proximity to each other on the Ottawa River, necessitating a certain amount of business intercourse.

Preliminary plans are being made for the annual meeting of the Canadian Pulp and Paper Ass'n, the date for which has been fixed for January 25th to 27th, 1928. The program committee of the Technical Section has already prepared a tentative program, which includes some very interesting subjects for discussion.

QUEBEC

Profits for St. Lawrence Paper

The annual financial report of St. Lawrence Paper Mills, Ltd., for the twelve-month period ended June 30, 1927, shows an increase in earning power due to the expansion which became effective during the year. Earnings of the company are shown at a record level and after payment of increased bond interest and a higher allowance for depreciation there remains available for the common stock after preferred dividends have been paid a sum equal to $3.66 per share, of which $50,000 have been issued out of a total $100,000 authorized.

At a meeting of the shareholders of Quebec Pulp and Paper Mills, Ltd., held in Montreal on October 3rd, the sale of the assets of the company to Price Brothers and Co., and Port Alfred Pulp and Paper Corp., was ratified unanimously.

President Chahoon, of Laurentide, has officially confirmed his company's purchase of timber limits of W. C. Edwards and Co., Hawkesbury Lumber Co. and Pembroke Lumber Co., aggregating some 3,500 square miles in the Ottawa Valley. He stated that no plans for any building operations in the Ottawa Valley had been made, but considered the purchase as a protection and to serve as a reserve of timber for future use. Several million dollars are involved.

Canadians Acquire Longueuil Plant

It is understood that Canadian interests, including one of the largest investment banking institutions in Montreal, have purchased control of Charles Walmsley and Co. (Canada), Ltd., Longueuil, from Sir W. G. Armstrong Whitworth and Co., of Newcastle-on-Tyne.

The Wamlsley Co. is one of the largest manufacturers of pulp and paper making machinery in Canada and operates under long-term agreement with Charles Walmsley and Co., Ltd., of Bury, England.

Two special by-laws were ratified by shareholders of St. Maurice Valley Corp., at a special meeting recently called for the purpose. The first of these provided for the conversion of 12,000 shares of preferred stock of $100 par value into 240,000 shares of $5 par value. The second provided for an increase in the number of directors from nine to twelve. An addition to the board of directors was also made through the election of Arthur Cross, who has been associated with the company in an executive capacity.

According to President Wallberg, rapid progress is being made on the Lake St. John Power and Paper Co.'s new mill at Dolbeau. Construction of the buildings is practically com-

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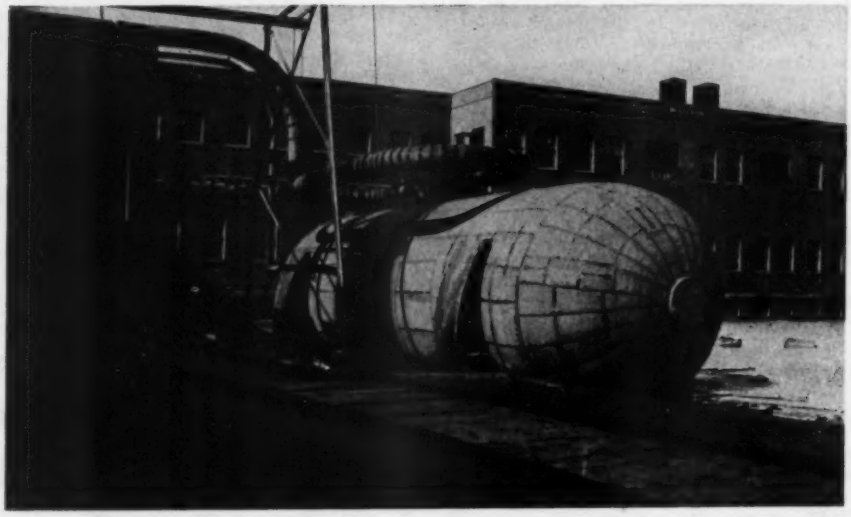

Higher Industrial Efficiencies —Increased Profits— By Using a Ruths Accumulator to Protect the Boiler House from Peak or Shock Loads

Why are boiler room efficiencies uniformly so much lower in industrial plants than in public utilities?

Some of the difference, to be sure, lies in the fact that public utility plants are usually larger and so justify greater outlay for equipment and supervision.

But that's only a small part of the answer.

The big outstanding reason, in all industrial plants with a fluctuating steam load, is that as fast as they "get set" for one load, the steam demand jumps or drops to some new figure.

The Ruths Accumulator stops that, definitely and automatically. It takes care of the variations, leaving the boiler house operating under a steady uniform load.

Give the Boiler House a Chance to Make a Showing!

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Canadian Representatives: Combustion Engineering Corp. Ltd., Montreal, Quebec.

pleted, installation of the two paper machines is proceeding and the remainder of the machinery and equipment is rapidly being put into place; so that it is expected to start production next month. Last winter's cut of 100,000 cords of pulp wood is now in the storage pile, and preparations are being made to cut a like quantity this winter.

E. G. Rolph, advertising manager of the Howard Smith Paper Mills, Ltd., recently gave a most interesting address on the manufacture of high grade papers from rags to the members of the Electrical Club of Montreal at one of their weekly luncheons at the Queen's Hotel.

The Saguenay-Quebec power line, which transmits 100,000 h. p. from the Ile Maligne plant of the Duke-Price Power Co. to Quebec City under a tension of over 150,000 volts, was officially inaugurated by Premier Taschereau last month. A large portion of this power is being used in the new mills of the Ste. Anne Paper Co., at Beaupré, near Quebec, and of the Anglo-Canadian Pulp and Paper Mills, Ltd., in Quebec City.

The Bonaventure Pulp and Paper Co., which owns a 125-ton sulphite mill at Chandler and has pulpwood limits back of Port Daniel, has installed at the latter place an up-to-date loading plant which is considered one of the finest in that part of the country. The wood is transported to Chandler over the Atlantic, Quebec and Western Railway, a distance of some 20 miles.

The Murray Bay Paper Co., Ltd., recently made a $2,000,000 bond issue, in connection with which interesting information has been published concerning the company. It is controlled through common stock ownership by a group comprising Abitibi Power and Paper, Spanish River, Mead Investment (of Dayton, Ohio), and allied interests. The company is now constructing a paper mill with a rated capacity of 120 tons of newsprint per day, about six miles from the port of Murray Bay, approximately 90 miles below the city of Quebec on the St. Lawrence River. It is expected the mill will be in operation early in the spring of 1928.

The company has acquired wood-cutting rights on Crown limits; lease of Donohue Bros.' groundwood mill having its own hydraulic development with an installed capacity of 8,450 h. p.; a contract for electric power with a subsidiary of the Shawinigan Water and Power Co., and a contract for sulphite pulp with the Ste. Anne Paper Co., which is controlled by the same interests.

I. P. to Build Board Mill Near Ottawa

Canada will have the largest fibre board mill in the world when construction work is completed on the new quarters of the International Fibre Board, Ltd., adjoining the Gatineau mill of International Paper. Henry J. "Bud" Wiser, president of the company, recently stated that the new mill will cost approximately $2,000,000. The organization is associated with Canadian International Paper. Construction work is already under way and expected to be finished by next May. It is said permanent employment will be given to about 200 men. The first unit will have a capacity of 50 tons per day.

This marks the first new industry attracted to the district by the immense power reserve of the Gatineau Power Co., and the facilities of Canadian International Paper. Several other large United States firms are understood to be looking over the local field as a possible location for branch factories.

Dominion Engineering Works is busy on the construction of the four machines for the Spruce Falls Power and Paper Co. The installation schedule calls for the first machine to be erected in February, the second in March, the third in April and the fourth in May.

Mr. A. L. Dawe has been appointed general manager of Canada Overseas, Ltd., which was recently formed to take charge of the overseas business of the companies associated in the Canadian Newsprint Co. The purpose is to keep in the closest possible contact with overseas customers and to concentrate on the service to, and development of, foreign business.

Brompton Pulp and Paper has placed orders for installation of Briner economizers and Ross heating and ventilating systems for the East Angus mill. The new Brompton mill at Bromptonville was equipped with these devices last year.

The Bates Valve Bag Co., of Chicago, has denied the statement that it intends to build either at Three-Rivers, at Windsor, or Walkerville, Ont. The statement published in these columns last month, was obtained from a usually dependable source, and confusion may have occurred because of the recent incorporation of the Walkerville Bag Co., Ltd., with head office at Walkerville, Ont.

Members of the Quebec Division of the Canadian Manufacturers Ass'n recently visited St. Jérome and were shown through the mill of the Rolland Paper Co. They were much impressed with the cleanliness of the mill and the very high grade of product turned out. This was the first mill in Canada to make fine writings.

Further enlargement of its already large holdings in the Ottawa valley by the Laurentide Co., is foreshadowed in rumors of the acquisition by this organization of the big McLachlin mills at Arnprior, Ont., and the limits which it operates in connection with them. The McLachlin firm at Arnprior owns some 1600 square miles of limits on the Ottawa, Petewawa, Coulonge and Black Rivers, and the holdings embrace all kinds of timber, from pulpwood to pine timber.

Hon Honoré Mercier, Minister of Lands and Forests for the Province of Quebec, accompanied by twenty officials of the provinicial government and members of the Press Gallery of the Quebec Legislature, made an inspection of Canadian International Paper's newsprint mill at Gatineau, and of Gatineau Power's hydro-electric power plants at Chelsea and Farmers on the Gatineau River.

Mr. James d'A. Clark, of Bowater's Paper Mills, near London, who is well known both in Canada and the United States, recently visited the mills of Ste. Anne Paper Co., at Beaupré, Anglo-Canadian Pulp and Paper Co., at Quebec, and the group of mills around Lake St. John.

At a recent meeting of the executives of the Canadian Pulp and Paper Ass'n, $150 was voted for prizes to be given to students of the School of Pulp and Paper Making, Three-Rivers. In this connection, a letter of appreciation was sent to the provincial government and to G. C. Piché, acting head of the school, complimenting them on the results accomplished, and wishing them continued success.

ONTARIO

$175,000,000 Merger

Directors of Abitibi Power and Paper Co. and Spanish River Pulp and Paper Mills met in Montreal recently and agreed upon final details of the proposed amalgamation of these companies. All that now remains necessary is the sanction of the shareholders. The plan provides for the acquisition by the Abitibi company of the common capital stock of Spanish River, Fort William Paper, Manitoba Paper, Ste. Anne Paper and Murray Bay Paper through an exchange of Abitibi common for the common stocks of the other companies. The plan does not affect the preferred stock or funded debt of the various companies and entails no new financing for the present.

This consolidation creates a third major Canadian paper and power group, having assets of $178,058,625; with an actual capacity of 650,000 tons of newsprint per year and a

In the South

BOGALUSA

EQUIPS THEIR HUGE No. 1
AND No. 2 BOARD MACHINES WITH

Ross Vapor Absorption Systems

North and South—leading Board Mills install the Ross Vapor Absorption Systems to increase their capacity and insure economy on their machines. Climate alone does not provide these important advantages. The installations for the Bogalusa Paper Co., of Bogalusa, La., one of the best known mills in the South, with machines turning out a high class sulphate board, again proves that Ross Vapor Absorption Systems are a good investment for the mill located in the mild South as well as in the cold North.

Our Engineers Will Gladly Tell You
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This System In Your Mill. Write us.

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potential capacity of 1,000,000 tons. There will be little change in the management of the company. Alexander Smith is president and George H. Mead, Spanish River president, is chairman of the board. Directors will be increased from ten to twenty-one members to include members of the Spanish board and other companies.

Stone Straw Corp. of Canada, Ltd., Toronto, was recently incorporated with a capital stock of $100,000 to carry on the business of manufacturers and dealers in straw and paper cardboard, and other preparations, boxes, bags, packages, books, etc.; also to make and deal in lumber, boxes, barrels, cases, etc.

Commercial Papers, Ltd., Toronto, was recently incorporated, with a capital stock of $200,000, to carry on the business of manufacturers of and dealers in paper, paper materials and paper substitutes, pulps, etc., manufacturing paper specialties and articles from paper, pulp, etc.

W. Stanley Hodge, of the Hodge Sherriff Paper Co., who recently returned from England, will reside in Canada in the future, making Toronto his headquarters, and dividing his time between that city and the Montreal office of his company.

W. P. Bennett, formerly president and manager of the Rudd Paper Box Co., of Toronto, has opened an office at No. 287 Bay St., Toronto, as a mill representative of boxboard and paper mills, and furnisher of all grades of printing ink and supplies for the paper box trade.

His Excellency the Lieutenant-Governor of Ontario recently entertained at luncheon a number of gentlemen associated with the pulp and paper industry and financial interests. The guests included E. W. Backus and Seymour Backus, of Minneapolis, U. S. Senator Brooks, of Minneapolis, and Messrs. I. W. Killam, of the Royal Securities of Montreal, A. R. Graustein, president of International Paper, E. R. Wood, of the National Trust Co.

President A. R. Graustein, of International Paper, has announced that his company has purchased the International Fibre Board Co., Ltd., which operates a mill at Midland, Ont. Henry J. Wiser, formerly president and treasurer of International Fibre Board, will have charge of the Midland mill and also the new board mill being constructed by International Paper near its Gatineau newsprint mill.

Ontario Paper Co. recently awarded a contract to the Riley Engineering and Supply Co. to equip ten of their present boilers, at Thorold, with Riley Atrita Unit Pulverizers.

It is the intention of the Ontario provincial government to oppose the scheme which E. W. Backus is entertaining for the flooding of certain international waterways in the Rainy River district, in connection with development plans he desires to prosecute. It is stated that the Backus policy would flood out considerable Crown lands, as well as agricultural lands. The matter is one coming within the federal jurisdiction, so that both Mr. Backus' request and the provincial government's representations in opposition thereto must be made at Ottawa.

Howard Smith Paper Mills have ordered from Dominion Engineering Works a new writing and book paper machine for their Cornwall mill. The new machine will be one of the largest of its kind, 153 inches wide, with suction couch roll, three wet presses, twenty-six 48-inch driers, an eight-roll calender stack, English reel, and Dominion slitter and winder. Remodelling of the paper machine room will be necessary to accommodate the new unit.

The Bagley and Sewall Co., of Watertown, N. Y., have begun work on the largest paper machine to be built in their shops, for the Great Lakes Paper Co., and will be installed in the newsprint mill which the company is at present erecting at Fort William. It is to be a 264-inch-wire machine, and will be exceeded in width only by the four 270-inch machines in the Gatineau mill of Canadian International Paper. It is being designed to run at 1200 feet per minute.

Board Factory for Toronto

The Dominion Envelope and Carton Co., Ltd., of Toronto, has purchased from the Toronto Harbor Commission a parcel of land having a total area of about eight and a quarter acres and valued at $164,000. The company proposes to erect a 125-ton paper board mill, a large portion of the output of which will be used in the carton department of the company. James L. Carey, of Chicago, will have charge of the erection of the plant and installation of the equipment. The plant will have a seven-cylinder board machine with 114 48-inch driers. The Toms Construction Co., of Toronto, has been awarded the contract for the building, and a good start has already been made on the work. Erection of the board machine is expected to start about the middle of next month.

BRITISH COLUMBIA

Thirty-five thousand acres of timber lands on Vancouver Island, involving $2,500,000, is reported to have been bought by Bloedel, Steward and Welch Corp., Ltd., large timber operators. The timber land is in the Great Central Lake, Sproat Lake and Albernie Canal districts. Plans are said to call for a large mill in a strategic location.

New Mill on Poplar Island

The mill on Poplar Island, projected by Senator Heisler of Washington and a number of New Westminster business men, will undoubtedly become reality. Fifty thousand dollars has been raised in Seattle by those interested, and a number of men in New Westminster, who had previously agreed to subscribe to a mill for the same district, have transferred their capital to the new company. The share capital of the company will be $1,000,000, of which $120,000 7 per cent cumulative stock is to be immediately issued. With each of these, one share of no-par-value common will be issued.

Senator Heisler has stated that the output of the mill, from the first unit to be constructed, will be 50 tons daily and the product will be exclusively Mitscherlich sulphite. He also stated to the New Westminster Board of Trade that on good authority he had received assurance that the entire output can be sold in advance for one or two years.

The Society for the Preservation of Canadian Forests has just been organized with headquarters in Vancouver, and branches in Toronto, Ont., and Terrace, B. C. The object of this new organization is to deal with the basic causes of forest fires, rather than with their effects, and to co-operate with other similar organizations in the Dominion.

NEW BRUNSWICK

F. W. Brawn, mill manager of the Nashwaak Pulp and Paper Co., St. John, N. B., has resigned and has been succeeded by O. F. Bryant. Mr. Brawn is retiring from the industry after a period of forty-seven years of service both in the United States and Canada.

It is reported from St. John that the output of the plant of the Bathurst Co., now turning out 65 tons of newsprint daily, will be doubled by next spring. Another paper machine has been ordered, and it is expected that the work of installation will be carried on during the winter.

Fraser Companies, Ltd., have made a bond issue of $1,664,500, to provide a portion of the cost of extensions and additions to the company's sulphite and paper mills. The

RYTHER AND PRINGLE COMPANY
CARTHAGE N.Y.

RYTHER CHIP SCREEN

INSTALLED AT
SPAULDING PULP & PAPER CO., NEWBERG, ORE.

The RYTHER CHIP SCREEN was chosen on account of its ability to classify the chips. This equipment has high capacity and is very compact. The construction is of steel throughout and the drive is Timken mounted. A Wood Ideal Chip Breaker is installed in the chipper. This equipment separates the chips and dusts the entire flow, which results in uniform chip conditions.

FOR CANADA REFER

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
10 PHILLIPS SQUARE, MONTREAL, P. Q.

plans call for an increase of 250 tons daily capacity of additional sulphite and groundwood at the Edmundston mill, and an increase of about 200 tons in the paper capacity of the Madawaska, Maine, mill of Fraser Paper, a subsidiary company. Work is already under way at the latter place.

Grand Falls Hydro-Electric Development

Construction work on the Grand Falls, New Brunswick, hydro-electric development of Saint John River Power Company is 70 percent complete. Concrete is being poured in the exterior walls of the powerhouse and erection of the steel penstocks is going forward.

There is less than 900 feet of concrete lining to be completed in the 2,700 foot pressure tunnel which will lead the water from above the dam to the powerhouse. The superstructure for the gates on the main dam and also the gates themselves are being erected.

The hydro-electric plant will be the largest power development in the Maritime Provinces of Canada. All of the common stock of Saint John River Power Company is owned by International Paper Company.

Fraser Appoints New Directors

Still further co-operation among prominent Canadian pulp and paper companies is indicated by the announcement that John H. Price, president of Price Brothers and Co., and George H. Mead, president of Spanish River, have been elected to the board of directors of Fraser Companies, of Edmundston. Donald A. Fraser, son of Archibald Fraser, president of the company, also becomes a director. These appointments were made at a meeting held at Edmundston on October 28th.

While Price Brothers and Spanish River are the oldest companies in the Canadian newsprint field, Fraser Companies is one of the principal Canadian manufacturers of high grade sulphite papers and bleached and easy-bleaching sulphite. A program of considerable expansion of the company's activities was recently announced in connection with a bond and debenture issue. Fraser Companies is well placed for future expansion by reason of its large holdings of spruce pulpwood in Eastern Quebec and New Brunswick and by the favorable location of its sulphite pulp mill at Edmundston and its sulphite paper mill at Madawaska, Maine.

NOVA SCOTIA

It is stated that plans for the erection of a paper mill on the Mersey, near Liverpool, N. S., and for the erection of a large sulphite plant at some open port in Cape Breton are now before the Provincial Government. One of the names mentioned is that of Ralph P. Bell, of Halifax, who is said to contemplate the erection of a paper mill on the Mersey if he can obtain a lease of certain pulpwood areas from the Crown.

A German Paper Mill Directory

Under the title **Papier-Addressbuch von Deutschland**, the publishers of the **Papier Zeitung**, Berlin, have for ten years past issued a useful directory of German pulp and paper manufacturers, including producers of paper and pulp boards of every description, as well as specialty papers and paper products generally. The present, eighth edition, consisting of 1,564 text pages and 100 pages of advertising is nearly twice as large as the volume published in 1925.

In this directory the names and addresses of every producer and distributor of paper and papermaking materials in Germany are given in complete detail as regards place of manufacture and character of product. The book is arranged alphabetically under groups according to firm name, character of manufacture and geographical location. A particularly useful section is a list of terms and names of products used in the paper and stationery trades in four languages—German, English, French and Spanish.

The number of associations of paper manufacturers, paper merchants and engineers in the German Republic as listed in this directory under the heading "Vereine und Verbände" is extraordinarily large and varied, the list occupying five pages of closely printed text, but it should be stated that includes the names of organizations of dealers in desk supplies and stationery besides associations of pulp and paper manufacturers and such purely technical organizations as the Verein der Zellstoffund Papier-Chemiker und-Ingenieure. The volume is well indexed, making it easy of reference, and, for those who have use for a directory of this kind, it seems well worth the price of 30 Reich marks.

Kommerzienrat Dr. Hans Clemm

Kommerzienrat Dr. Hans Clemm, president of the Zellstoffabrik Waldhof, Mannheim-Waldhof, Baden, Germany, with sulphite pulp mill there and paper and pulp mills at Tilsit, Prussia, ided on Saturday, October 29, in the fifty-fifth years of his age. Last July he celebrated the twenty-fifth year of his connection with the great German pulp and paper company known as Zellstoffabrik Waldhof. He was well and favorably known among American pulp and paper manufacturers as he paid frequent visits to the United States, one of his good friends in New York being Dr. Viggo Drewsen, of the West Virginia Pulp and Paper Co. Doctor Clemm was born at Ludwigshafen-on-the-Rhine on December 18, 1872, the son of Dr. Carl Clemm, one of the founders of Zellstoffabrik Waldhof in 1833. Dr. Hans Clemm was graduated in chemistry, "summa cum laude," and was for some time assistant to Prof. Emil Fischer in Berlin. He turned to pulp and paper work in 1898 and pursued the study of pulp manufacture with characteristic energy and notable success. In July, 1902, he was chosen president of the Waldhof company. The attention paid to chemical problems and the development of laboratory work generally at the Waldhof plant are believed to be among the greatest factors in its success. Doctor Clemm was a believer in the adage "the laboratory is the brains of a factory."

Reforestation in Rumania

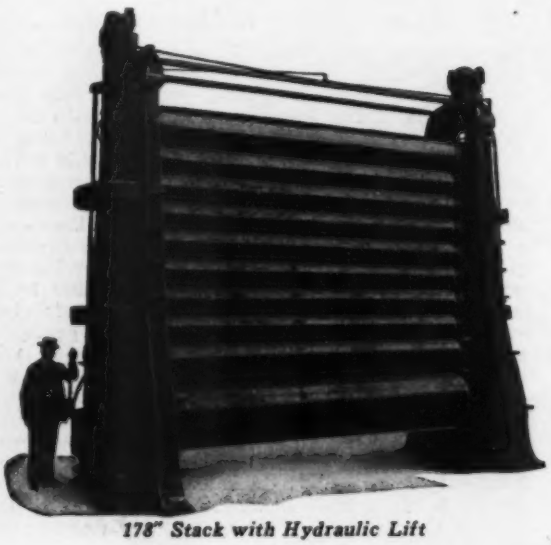
Dr. M. Dracea, a prominent member of the Rumanian forest service and professor of reforestation and wood utilization in the National Polytechnic Institute at Bucharest, has just completed a three months' stay at the U. S. Forest Products Laboratory, Madison, Wis.

Dr. Dracea is primarily interested in forest ecology, and for some years has also been studying the practical problem of harmonizing commercial forest exploitation with national forest policy. He claims to have found in the United States many helpful pointers along this line, and states that conditions under which forestry is developing in Rumania are analogous to those in young countries like America, rather than countries where forest policy has been longer crystallized, as France and Germany. Rumanian state forestry is of comparatively recent development, having been inaugurated in the 1850's. About one-quarter of the area of the country is forest, either virgin or cultivated. The stand consists of 25 per cent spruce and fir, 25 per cent species of oak, 30 to 40 per cent beech and miscellaneous hardwoods, among them black locust, introduced 170 years ago from America and now flourishing on thousands of acres of Danube river bottom and Rumanian prairie.

Despite this wealth of timber, foresters and lumber producers of Rumania have sometimes found themselves at loggerheads as to methods and rate of exploitation. After all, Dr. Dracea points out, the size of Rumania is a little less than half that of the state of Texas, and on that area 17,000,000 people are supported, giving a population density per square mile four times that of the U. S. A. as a whole. Under these conditions, a rather careful balance must be maintained between exploitation and growth of timber to guarantee future forest supplies.

The Hill Clutch Machine and Foundry Co., of Cleveland, O., has opened metropolitan district offices at 30 Church St., New York, Room 528, in charge of Charles C. Phelps, sales engineer.

FARREL



178" Stack with Hydraulic Lift

FARREL CALENDERS
AND
FARREL ROLLS

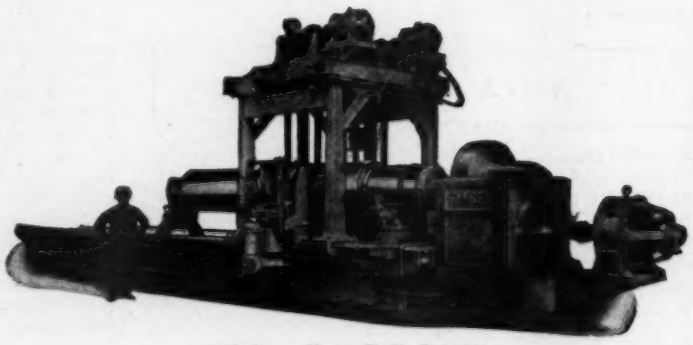
are made in all sizes
up to and including

264" ON THE FACE

Calenders are made with HYDRAULIC, ELECTRIC OR RATCHET LIFT, all operated from the floor.

FARREL NEW TYPE ROLL GRINDER

is built in 24", 32", 36" and 42" sizes, all electrically driven throughout, lubricated automatically and fitted with geared head, new crowning device and other improvements.



36" New Type Roll Grinder

FARREL-BIRMINGHAM CO. INC.
ANSONIA, CONN.

Successors to

Farrel Foundry & Machine Co., Ansonia, Conn. *and* Birmingham Iron Foundry, Derby, Conn.

Branch Plant: BUFFALO, N. Y.

Activity of Paper Industry in Work of Shippers' Regional Advisory Boards

In order to provide a meeting ground where producers, distributors and railroads may discuss common problems in an effort to improve transportation, the United States has been divided into districts in each of which a Shippers' Advisory Board has been organized. These advisory boards are composed of representatives of agricultural and industrial producers and distributors on the one hand, represented by various commodity committees, and of railroads and the American Railway Association on the other hand, represented by a contact committee for each region.

The objects of these regional advisory boards are as follows:

1—To analyze and forecast the transportation needs in each region.

2—To promote more even distribution, thereby minimizing opportunities for market gluts.

3—To effect greater freight car and operating efficiency.

4—To enable more adequate understanding by railroads of transportation needs of the public.

5—To enable a better understanding by shippers of car distribution problems.

6—To adjust informally conflicting opinions involving car service.

Meetings are held quarterly at which time reports are presented by the committees representing the various industries, commercial organizations covering all of the larger cities of the region involved, less than carload traffic conditions in the various shipping centers and reports by the railroads indicating their conditions as to equipment, service, capacity loading, etc.

These commodity committee reports contrast actual loadings for the corresponding period the year before with prospective car requirements for any given quarter. At a meeting of the Atlantic States Shippers' Advisory Board, held in Atlantic City, October 5 and 6, reports were presented by committees representing twenty-seven industries, including cotton, vegetables, lumber, oil, iron and steel, cement, automobiles, chemicals and paper, the totals of which indicated a prospective increase in car requirements for October, November and December, 1927, of approximately 1½ per cent over actual shipment during the same quarter in 1926. It is interesting to note that the total anticipated requirements for the next quarter in the territory covered by the Pacific Northwest Advisory Board shows an increase of upwards of 5 per cent over actual shipments during the corresponding period in 1926. The Atlantic States Board's Pulp and Paper Committee reported prospective increase of 10 per cent for the coming quarter, while the Pacific Northwest Board's Pulp and Paper Committee indicates prospective increased car requirements of 10.8 per cent.

O. M. Porter, assistant secretary of the American Paper and Pulp Association, is chairman of the Pulp and Paper Committee of the Atlantic States Advisory Board, the personnel of which is as follows:

H. F. Masman, vice chairman, traffic manager, National Association Waste Material Dealers; W. J. Mathey, vice chairman, traffic manager, American Newspaper Publishers Association; A. H. Campbell, traffic manager, International Paper Company; Stuart H. Brown, assistant secretary, Union Bag & Paper Corporation; C. C. Furgason, traffic manager, West Virginia Pulp & Paper Company; J. S. Gill, traffic manager, The Upson Company; D. G. Kibbey, traffic manager, A. P. W. Paper Company; George Lucas, director of transportation, National Publishers' Association; C. J. McIntyre, traffic manager, Dill & Collins Company; Joseph A. Quinlan, traffic manager, St. Regis Paper Company.

"Analysis of the reports presented by the various industries, commercial organizations and railroads at these advisory board meetings would give an extremely accurate forecast of general business conditions throughout the United States," says Paul S. Hanway, statistician of the American Paper and Pulp Association.

Hugh P. Baker, secretary of the American Paper and Pulp Ass'n, was in Chicago last month for a meeting of the

Frederick
Centrifugal
Pumps

Single-Suction Standard Paper Mill Stock Pump

Where Only the Best Will Do

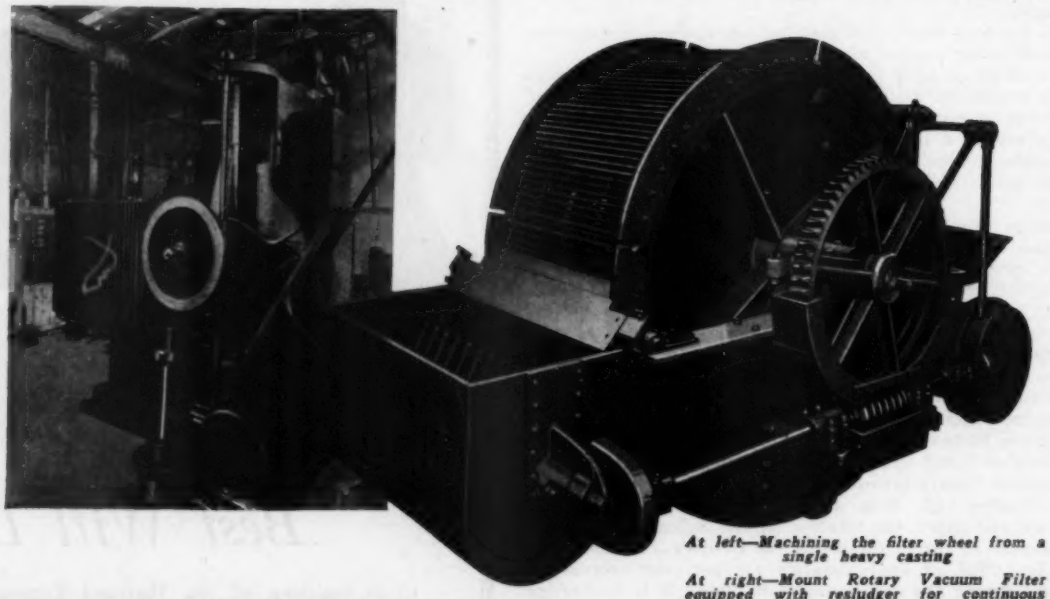
The opening of the Holland Tunnel this fall is said to mark a new era in traffic handling. The Holland Tunnel consists of a pair of gigantic tubes running under the Hudson River, to accommodate vehicular traffic between Jersey and Manhattan. It cost $49,000,000.00 to build. Pumps were needed to eliminate seepage and also to guard against emergency leakage in this tunnel. For such important service, only the best pumps obtainable were good enough. Frederick Pumps were chosen. Twenty-two Frederick Pumps have been installed to safeguard the largest vehicular tunnel in the world and one of the greatest engineering feats of the age.

There is a Type of Frederick Pump Suitable to Your Needs

The Frederick Iron & Steel Company
Frederick, Maryland

In Canada:
Dominion Engineering Works, Ltd., Lachine, Que.

SWENSON CONTINUOUS EQUIPMENT



At left—Machining the filter wheel from a single heavy casting

At right—Mount Rotary Vacuum Filter equipped with resludger for continuous handling and washing of lime sludge in recovery department of sulphate mill. (Shop view with wire cloth removed.)

THE MOUNT ROTARY VACUUM FILTER

The Rotary Vacuum Filter has been used with distinct success for many processes in the modern pulp mill, among which are continuous lime sludge filtration and continuous pulp washing. Years of truly continuous service in these departments have proven the supremacy of the Mount Rotary Vacuum Filter. Its fundamental design eliminates the difficulties sometimes experienced with other types of the vacuum filter and the ruggedness of construction assures against expensive shutdown periods. A wealth of detailed experience leaves nothing to chance.

Mr. W. D. Mount, Consulting Engineer with offices at 602 Peoples National Bank Building, Lynchburg, Virginia, is available for consultation regarding the application of any of the following well-known Mount equipment:

Continuous Causticizing Systems
Lime Recovery Plants
Rotary Vacuum Filters
Pulp Washers

ESTABLISHED 1889 **SWENSON** ESTABLISHED 1889

EVAPORATOR COMPANY
(Subsidiary of Whiting Corp.)
Main Office and Works: 15673 Lathrop Avenue, Harvey, Ill.
(Chicago Suburb)
Sales Offices in New York, Chicago, Buffalo, Detroit and San Francisco
Mount processes for alkali manufacture or recovery.
Mount vacuum filters.

General Carton Packing Committee, which is made up of representatives of associations of manufacturers and merchants. As the committee was called into existence to carry through a certain amount of investigative work, and not for promotive purposes, it was decided at the Chicago meeting of the committee that its objectives had been accomplished and the committee was accordingly disbanded. A special subcommittee was appointed, however, to bring together in pamphlet form all available information as to the use of cartons for the shipment of paper. This pamphlet is to be given wide distribution as informative material for both manufacturers and merchants.

BRITISH CORRESPONDENCE

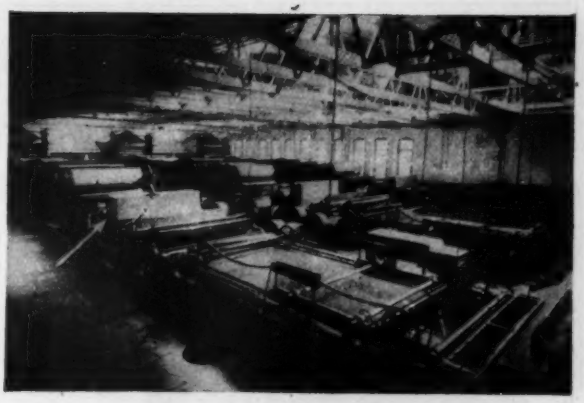
Pulp from Indian Bamboo

The visit of Mr. Raitt of the Indian Forestry Department to this country has brought about a considerable interest in the possibilities of Indian bamboo pulp which he has been urging so eloquently and persistently; but at present there seem to be little signs of any action being taken to exploit this new raw material. One mill representative has pointed out that the stumbling block to progress lies in what he terms "vested interests." He points out that certain of the largest consumers have big financial interests in pulp and paper mills in Newfoundland. Another section have their money invested in chemical pulp mills in Germany, and in esparto concessions in North Africa. Furthermore, a number of continental pulp and paper mills have been, and still are, financed by merchants and others interested in paper trade in this country.

Apropos, it is interesting to learn that another large papermaking concern in Germany will shortly come under British control, the whole share capital of the Koslin Paper Works, Pomerania, having been acquired by an English company—The Combined Pulp and Paper Mills, Ltd. This concern has control of several mills, included among which are the Cellulon Yarn Spinning Co., which works a secret process for the manufacture of a new textile product resembling a paper yarn, and the Hanover Paper Works, a company owning eight machines producing several varieties of paper. Another mill in the group specializes in the production of special vegetable parchment, and a straw pulp factory is in course of construction. This will have an annual output of 12,000 tons, and it is estimated that it will be able to produce straw pulp at from approximately $45 to $50 per ton, figures which compare very favorably with $75 per ton which is now paid for wood pulp. This, it is anticipated, will save the concern something like $360,000 per annum.

Resources in West Indies—Another authority has pointed out that there is another field besides the forests of India where the British paper maker may get the raw material which he requires. He points out that, with the almost certain shortage of raw material in the not distant future, British paper makers may find themselves squeezed into a tight position unless the practically illimitable resources of the Empire for paper making are devloped and made secure by British paper manufacturers. The new field suggested has been brought within the bounds of possibility by the movement in British and American financial and engineering circles to secure the sugar mills of the West Indies for papermaking purposes on a big scale, and it is understood that a company has been formed for putting down pulp works in Jamaica, a sum of approximately $460,000 being mentioned as the initial outlay.

One British trade organ points out that it is claimed by the promotors of the scheme, who have explored the possibilities of the West Indies islands thoroughly and have obtained considerable support from the sugar mill owners, that bamboo can be collected and crushed in the sugar mills of the West Indies, thus creating a new industry for these distressed islands and finding work for the sugar mills all the year round, instead of, as now, four to five months only. It is also claimed by experts that not only bamboo, but bagasse



Where every minute counts!

TIME is money to paper makers. Every minute added to productive time is money saved, just as every minute added to a shut-down is money lost. In keeping minutes on the right side of the ledger, do not forget the importance of efficient cleaning. Use modern Oakite materials and methods and you will get *more* cleaning in a given number of minutes than in any other way. You will save time and labor in washing felts, in cleaning Fourdrinier wires, dandy rolls and other paper mill equipment. Your cleaning costs will be *lower*, too, because Oakite materials are the most economical you can use.

Drop us a line today and find out what Oakite can do for you in your mill. No obligation.

Oakite is manufactured only by

OAKITE PRODUCTS, INC., 16A Thames St., NEW YORK, N. Y.
(*Formerly OAKLEY CHEMICAL CO.*)

Oakite Service Men, cleaning specialists, are located at

Albany, N. Y., Allentown, Pa., Altoona, Pa., *Atlanta, Baltimore, *Birmingham, Ala., *Boston, Bridgeport, *Brooklyn, Buffalo, *Camden, N. J., Charlotte, N. C., Chattanooga, Tenn., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, O., Decatur, Ill., *Denver, *Des Moines, Detroit, Erie, Pa., Flint, Mich., Fresno, Cal., *Grand Rapids, Mich., Harrisburg, Pa., Hartford, *Houston, Tex., *Indianapolis, *Jacksonville, Fla., *Kansas City, *Los Angeles, Louisville, Ky., *Memphis, Tenn., *Milwaukee, *Minneapolis, *Moline, Ill., *Montreal, Newark, N. J., Newburgh, N. Y., New Haven, *New York, *Oakland, Cal., *Omaha, Neb., *Philadelphia, *Pittsburgh, Portland, Me., *Portland, Ore., Providence, Reading, Pa., *Rochester, N. Y., Rockford, Ill., *Rock Island, *San Francisco, *Seattle, *St. Louis, South Bend, Ind., Syracuse, N. Y., *Toledo, *Toronto, Trenton, *Tulsa, Okla., Utica, N. Y., *Vancouver, B. C., Williamsport, Pa., Worcester, Mass.

*Stocks of Oakite materials are carried in these cities.

OAKITE

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Industrial Cleaning Materials and Methods

LOBDELL

IMPROVED
MICROMETER ROLL CALIPER

Is indispensable to the mill equipped to regrind its own rolls and is equally useful in every mill in keeping an accurate check on the condition of the calender and press rolls.

Light Weight
Easily Adjusted
Extremely Accurate

LOBDELL CAR WHEEL COMPANY
Established 1836
WILMINGTON, DELAWARE

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. **BOSTON, MASS.**

sugar cane waste can be used for making sulphite and that the collection of millions of tons of bamboo and bagasse in these colonies, the crushing, chemical preparation, and baking, are well within the bounds of possibility.

At the present time, the bagasse waste is burned under boilers, and for fuel purposes can hardly be valued at much more than a dollar a ton. If, as Mr. Raitt claims, his Indian bamboo pulp can be shipped to England at £3 a ton less than the equivalent quantity of wood-pulp, the Jamaican material can be regarded as an even cheaper proposition.

It is considered that if British paper makers resolve to obtain control of their own supplies, they should not overlook the claims of the West Indies, particularly as it has been suggested that American money is already available for the exploitation of the West Indian sugar mills.

In regard to the overseas interests of the British paper merchants mentioned above, it is interesting to notice that Lendrum, Ltd., one of the leading merchants, are at present making use of double-page advertisements in the printing trade press, showing photographs of mills in Norway in which Follum newsprint is produced on a large fast-running British papermaking machine (Charles Walmsley's), under British supervision.

Import and Export Figures

Imports of paper for the month are down 4336 tons, although on the first eight months of the year, they are up 6,700 tons. Imports of raw materials for papermaking were up last month 14,500 tons, and for the eight months, 86,408. Exports of paper are down 4,800 tons on the month, and 16,248 tons for the eight months. Home consumption is, on the increase, and fresh uses for paper are being constantly found. The increased demand is not, however, sufficient to keep British mills fully employed, although the increase is about 10 per cent.

The position of the British paper maker in regard to his raw material is not altogether satisfactory. At least 90 per cent of it comes from abroad, nearly the whole of which is from continental countries that are our keenest competitors for manufactured paper, and Canada, an important part of the British Empire is so situated that although the biggest producer of British wood-pulp in the world, she is unable to supply this country.

According to the **Board of Trade Journal**, exports of printing paper and cardboard from the United Kingdom to the Straits Settlements for August amounted to 1484 cwts., valued at £2,414 (compared with August 1926, 1316 cwts., and £2,638); and for January-August 12,671 cwts., at £21,263 (compared with last year 11,527 cwts. and £19,771). For writing paper, the figures are: (August) 809 cwts., at £2,397, compared with (1926) 441 cwts., at £1,331; and January-August 3,678 cwts. at £12,438 compared with (1926) 3,182 cwts., at £11,020.

Below are set out the values of the papermaking materials and paper and cardboard imported into Great Britain in September, together with the increases and decreases as compared with the corresponding month of the two preceding years:

	September 1927	Inc. (+) or Dec. (−) as compared with 1926	as compared with 1925
Paper-making Materials	1,149,649	−5,285	+29,331
Paper and Cardboard	1,548,114	+403,536	+428,199

Quantities of the same articles imported:

	Sept., 1925	Sept., 1926	Sept., 1927
Wood pulp, tons	123,390	148,790	138,522
Paper, cwt.	1,076,561	1,116,227	1,606,496

Values of the same materials exported:

	September 1927	Inc. (+) or Dec. (−) as compared with 1926	as compared with 1925
Paper-making Materials	116,775	+22,780	−21,525
Paper and Cardboard	808,359	−103,065	−202

Quantities of the same materials exported:

	Sept., 1925	Sept., 1926	Sept., 1927
Paper & cardboard, cwt.	447,300	464,581	379,650

Mr. L. C. Cooley has recently been appointed chemical engineer for The Swenson Evaporator Co., Harvey, Ill., a

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

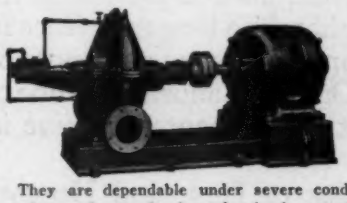
STEEL

Quaker Rubber Belts for Hard Service

The paper mill demands the highest quality in belting, ability to handle the heavy transmission loads and to resist moisture. The strength and durability in Quaker Belts make them specially well-adapted for this exacting service.

Quaker Belts are "made to order" to meet your requirements.

QUAKER CITY RUBBER CO.
Manufacturers of Daniel's P. P. P. Rod Packing
Wissinoming, Philadelphia.
Branches: New York, Chicago, Pittsburgh, San Francisco



The LAWRENCE "VORTEX" Centrifugal Pumps are built in many types, one of which is suitable for your requirements.

They are dependable under severe conditions and when called on for continuous hard service for long periods do not fail.

Their excellent design, superior workmanship, careful testing, and conservative rating assure satisfactory results.

Please use P. O. Box 70 in addressing.

Lawrence Pump & Engine Co.

P. O. Box 70 LAWRENCE, MASS.

Blaw-Knox Digesters—

from the most modern Forge & Hammer Welding Plant in the world ✓✓

Blaw-Knox Digesters, built in the Forge and Hammer Welding Plant of the Blaw-Knox Company, are designed by engineers experienced in designing equipment for the paper industry. Exclusive machinery, modern plant layout, most improved methods, together with long experience in rigid shop practice, insure superior results. One-piece annealing is one of the latest requirements exclusive in the Blaw-Knox plant.

A long list of Forge and Hammer Welded Digesters in service—(none of which has ever failed) . . .

The most modern Forge and Hammer Welding plant in the world . . .

These are what Blaw-Knox Company can offer you.

We shall be glad to furnish quotations on stationary, rotary, and tumbling Digesters.

BLAW-KNOX COMPANY
685 FARMERS BANK BLDG., PITTSBURGH, PA.
NEW YORK BALTIMORE BIRMINGHAM DETROIT SAN FRANCISCO
CHICAGO BUFFALO CLEVELAND PHILADELPHIA

Export Division
MILLIKEN BROS.—BLAW-KNOX CORP.
342 Madison Ave., N. Y. City

BLAW-KNOX

WP-2959

subsidiary of Whiting Corp. Mr. Cooley is a graduate of Massachusetts Institute of Technology and a member of both the American Chemical Society and American Institute of Chemical Engineers. He has had a wide experience in the installation and operation of evaporators, filters and related process equipment and is very well qualified to carry on the work for which he has been chosen.

PACIFIC COAST NEWS

To Make Pulp from Grape Vines

The Sacramento Pulp and Paper Co., has been organized with a capital of one million dollars and will build a pulp and paper mill in Sacramento. Directors are: H. D. Wagnon, V. Panattoni, J. Garnett Smith, R. M. Conley and Charles B. Bills.

H. D. Wagnon is the discoverer of a process for making pulp and paper from grape vines and has applied for a patent covering the process. Sacramento is a center of the grape industry in California, being surrounded with about 100,000 acres of vineyards.

It is planned to have the new plant in operation by next March. A 600 h.p. boiler plant and a 25 ton paper machine will be installed.

New Sulphate Mill

It has been announced that the Willapa Pulp and Paper Mills will build a 50 ton sulphate mill between South Bend and Raymond, Wash., the heavily timbered Willapa Harbor country. The company has been capitalized at $1,000,000, and with each of the 3,000 shares of 7½ per cent preferred stock, gives as a bonus one share of no par common voting stock.

Only pulp manufacture is contemplated at present, but a paper plant is planned for the future. The site of the new mill has excellent docking facilities, as two 8,500 ton steamers may be accommodated at the same time. Arrangements have already been made with sawmills for waste slabwood supply, and 500,000 feet of timber are said to be held in reserve.

R. A. Swain of Seattle, is president and chairman of the board, Jay Bowerman, former governor of Oregon, is vice-president, and E. A. Barry of Seattle is secretary.

The Johns-Manville Corp. has recently organized a new department known as the Pulp and Paper Dept., which will take care of their output of asbestos, insulating products, packings, roofings and packing cements. This new department is under the direction of J. S. Carroll, vice-president. W. R. Jones of San Francisco, is Pacific Coast manager.

At a recent meeting of the West Coast Lumber Extension Bureau in Aberdeen, Wash., Mr. J. B. Fitzgerald, head of the publicity department of the bureau, brought out the close relationship between the lumber mills and pulp manufacturers. He stressed the advantage of co-operation and friendliness between these industries.

The mayor of Grays Harbor, Wash., has made application to the state department of hydraulics for authority to divert 25 cubic second feet of water from the Wishkah River, seven miles north of Aberdeen, where an eight foot dam 100 feet wide is proposed. The cost of the development is estimated at $50,000. This is said to be indicative of further pulp and paper development in that locality.

The Union Bag and Paper Corp. has appointed W. W. Griffith as manager of the new plant which they will erect at Tacoma, Wash. The company expects to establish offices at Tacoma shortly, and Mr. Griffith will have charge of the construction program. He has managed several of their mills and is a capable executive.

Mason B. Olmsted, formerly sec'y and sales manager of

Simplicity

is the

secret of

BRISTOL'S

Reputation for Long Service

The length of time Recording Instruments will maintain accurate readings without repairs or readjustments is greatly influenced by the directness with which such readings are transmitted from the measuring element, through the pen, and onto the chart.

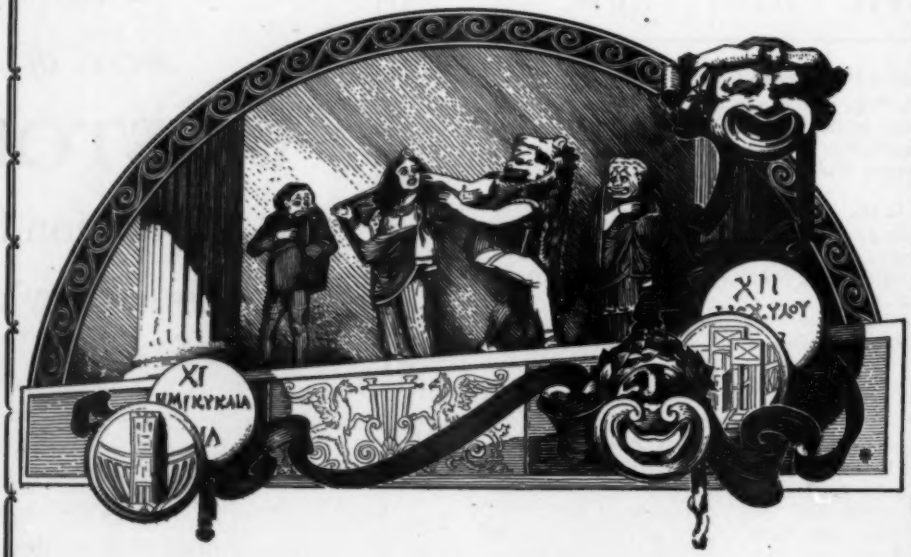
Note the simplicity of Bristol's construction shown in the illustration. No multiplying devices whatever are used—the pen attaches directly to the measuring element. Thus cause for trouble is eliminated, for there is nothing to get out of order. No inaccuracies through friction can result.

Interior view of Bristol's Recording Thermometers.

Such equipment is a distinct asset to your plant, not only for its low maintenance cost, but in the unfaltering good service it will give you for years. Sales Engineering Service provided. Write us about your problems.

The Bristol Company Waterbury, Connecticut

FOR 38 YEARS MAKERS OF BRISTOL'S RECORDING INSTRUMENTS



Admission: One Bone

POMPEII with its theatre tickets of carved bone found guidance and entertainment in the offerings of the stage. Good and evil, reward and punishment, guile and innocence, the whole worked up into a cross section of life, have held the same keen interest through the ages.

In Pompeii the crier announced the coming of the play. These days we read the advertisement in our favorite newspaper. Then, the scene was explained by voice; now, we refer to our program. Then, a slab of bone served a long life as a ticket; now, we print a new batch of pasteboards for each performance.

The play is still the thing, but its technique has changed. Much of its burden of detail has been given to paper to carry.

HAMMERMILL PAPER CO.

ERIE, PA.

the Fox River Paper Co., Appleton, Wis. has gone with the Zellerbach Paper Co., San Francisco.

The building occupied by the B. G. Ewing Paper Co., Spokane, Wash., was recently destroyed by fire. The loss was estimated at $150,000 which was well covered with insurance. It is stated that plans for re-building have already been announced.

The new plant of the Tumwater Paper Mills at Tumwater, Wash. began operation Oct. 10th, and has the distinction of being the first concern on Puget Sound to manufacture wrapping paper. The capacity of the plant is 60 tons per day.

Ground has been prepared on the site of the new $3,000,000 plant of the Pacific States Pulp and Paper Co. at Junction City, Wash., on the Columbia River, and work on the plant itself will start in the near future. It is said the plant will be ready to operate as soon as an industrial water supply is available, which is expected by October, 1928.

At Salem, Ore., the American Pulp and Paper Co. has been incorporated for $10,000 to operate pulp and paper mills.

NEW ENGLAND NEWS

Paper Mills Damaged by Floods

Many paper mills throughout New Hampshire, Vermont and Western Massachusetts were badly damaged by severe floods which swept over that section following torrential rain storms November 3 and 4. The Connecticut River was swollen and its tributaries already full from a very wet season. Broken dams were reported all up and down the valley, much of this damage being due to pulpwood which broke away from paper mill booms north of the White River Junction. This piled up on dams and breakwaters below, and with the rushing waters, formed an irresistible force.

The Babbitt-Kelley Paper Co., Bellows Falls, Vt., was washed away from its foundations, the loss being estimated at $200,000. The International Paper Co.'s plants at this point were partly flooded and other mills suffered greatly.

At Fitchburg, Mass., the boilers of the Fitchburg Paper Co. were flooded. $10,000 worth of paper was destroyed at the plant of the Dennison Mfg. Co., Framingham, Mass.

Other mills which suffered heavy losses were, Berkshire Hills Paper Co., Adams, Mass.; Crane Co., Dalton, Mass.; Esleeck Mfg. Co., International Paper Co. and Keith Paper Co., Turners Falls, Mass.; Smith Paper Co., Lee, Mass.; Westfield River Paper Co., Russell, Mass.; Adams Paper Co., Wells River, Vt.

Long Distance Steam Transmission

C. W. Conrad, plant engineer, of Bird & Son Inc., gave an interesting description of long distance steam transmission as accomplished by his company, before the New England Section Meeting of the American Society of Mechanical Engineers. During the fall of 1924, Bird & Son operated two boiler plants a distance of 4,000 feet apart at Norwood and East Walpole. The former was fired by oil, except one boiler which was fired by waste products. The East Walpole installation was modern and fired by coal stokers.

Fuel oil costs were rising rapidly, and the Norwood plant needed replacing or a supply of steam from East Walpole. The latter course was decided upon, for the East Walpole plant could be run at higher ratings and supply the necessary extra pressure. The line was built at a cost of $85,949. Figuring fuel oil at market prices, there has been a net saving, allowing for interest depreciation etc., of $73,000 during the period of operation.

The line itself is 4550 feet long; is 8 inches in diameter, .0322 inches thick, steel pipe. It is designed for 200 pounds pressure and 100 degrees superheat. It runs along the New Haven R. R. right-of-way between the plants, and with dis-

We offer a standardized Painting Procedure

VORCOLITE customers are not "paint shoppers." Far the greater number of them have found, in the Vortex Painting Method, a gratifying solution for all their painting worries.

1. They make an annual appropriation for painting.
2. They standardize on Vorcolite flat white because of its rich pigmentation, long life, easy cleaning, perfect diffusion of light, and its complete coverage in single applications.
3. They achieve the lowest possible finished cost by means of the Vortex Painting Equipment—loaned without charge to Vorcolite users—which also means minimum nuisance, little if any scaffolding, no ordinary paint gun troubles. Their own "handy man" labor does the work and when through, guns are shipped back to us.

Most important of all, they learn to think of paint cost in terms of square feet, not price per gallon. Send for the Vortex check sheet and let us submit a proposal that will be suitable for your problem.

THE VORTEX MANUFACTURING CO.
1981 West 77th Street • • • Cleveland, Ohio

Painting Equipment is Loaned

Vorcolite
and the VORTEX PAINTING METHOD

Fill out and mail

VORTEX MFG. CO.
West 77th St., Cleveland, Ohio
Please send us check sheet to outline our painting problem. It is on new construction? _____ Buildings already in use? _____
Company _____
Address _____
Attention _____

V-39

Wood Tanks of All Kinds

We are equipped to build any kind of a wood tank used in the paper trade.

Our engineering department will gladly assist you and advise you concerning Stave Pipe, Acid Towers and Wood Tanks.

Experienced men build all of our tanks in our own modern tank factory.

Consult us — at once — in regard to your tank problems.

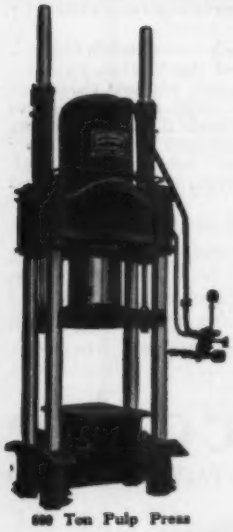
The A. T. STEARNS LUMBER CO.

NEPONSET

BOSTON - - MASS.

SOUTHWARK

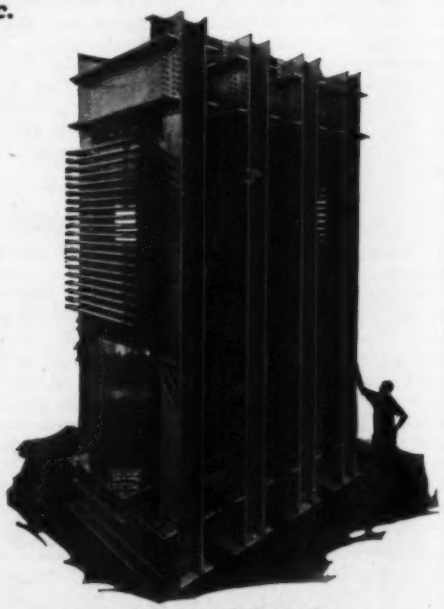
Hydraulic Equipment for Pulp and Paper Mills, Wall Board Plants, Etc.



600 Ton Pulp Press

PULP PRESSES
BALING PRESSES
WALL BOARD PRESSES
PULP TRUCKS
HYDRAULIC PUMPS
ACCUMULATORS
VALVES, FITTINGS, ETC.

Southwark Hydraulic Equipment is the choice of the largest and best known Pulp and Paper Mills throughout the country. They find Southwark products give the most efficient service under exacting conditions. Write for Bulletin No. 14.



2000-ton 12'-6"x4'-6" 20 Opening Wall Board Press

SOUTHWARK FOUNDRY and MACHINE CO.

400 WASHINGTON AVENUE
PHILADELPHIA, PA.

CHICAGO
343 S. DEARBORN ST.

AKRON
100 E. SOUTH ST.

tributing mains at Norwood, the length from the original source of power is well over a mile. Numerous tests in cold weather prove line loss of but 2.69 per cent. Condensation losses are not serious, and the line is efficient and more economical than would have been involved in the construction of a new plant with concomitant interest on investment and costs of operations. Mr. Conrad suggests this as a possible solution for many paper mills whose scattered units are powered by small inefficient plants, also as a possible means of reducing power costs in industrial centers where numerous plants are located within a reasonable distance of one another.

American Writing Paper Make Report

A splendid fiscal report has been announced by President Sidney L. Willson, president of the American Writing Paper Co., Inc. following a meeting of the Board of Directors. Gross earnings for the six months starting March 1st aggregated $412,364. Net earnings after deduction of bond and note interest amounted to $196,714. Commenting on this favorable showing, President Willson said that the past four months or the summer season is always the poorest period of the year for paper manufacturers. Despite that fact, our company has shown profits each month, July usually the dullest month of the year, showed earnings for the first time in many years. The company's balance sheet shows cash on hand of $1,233,644; notes and acceptances receivable of $138,221, less reserves of $6,123; accounts receivable of $1,290,047; inventories at cost or market if lower of $2,739,366, or total current assets of $5,395,166. The total current liabilities are, accounts payable $368,027.47, and accrued accounts of $262,157, a total of $630,185, about half the company's cash on hand and less than one-eighth of their current assets. Plants and equipment fully depreciated are rated at $10,502,118. Choral Properties Inc., the segregated plants which will be sold at $539,954, prepaid expenses at $58,234. Trade marks are rated at $1.00.

After deducting receiver's losses for January and February, and interest on the funded debt for those months, the company has net earnings applicable to stock of $103,504, though, of course, no dividends are contemplated at present. The company's preferred stock has risen 25 points to over 50.

New Lines of Paper

Z. & W. M. Crane have introduced a new quality of book paper, a 100 per cent rag stock, which combines the qualities of a machine-made paper with the old-fashioned atmosphere associated with hand-made papers. The new stock is made in one color, natural white; one size 25 by 38; and one weight, 160 pounds to the 1000 sheets, with a deckle edge. Z. & W. M. Crane, Inc., is closely affiliated in management and ownership with Crane & Co., and it has been their intent to make a sheet as good in its class as Crane's Bond and Linen Lawn are in their class.

The Brown Co. have sent out samples of their new Duracel paper, which is made from a new pulp developed after years of research. It has unusual tearing, bursting and folding qualities, durability much greater than other wood fibre papers, and exceeding chemical purity. It is believed that this sheet possesses the desirable qualities of an ideal cable winding paper. It is a light brown in color.

The American Writing Paper Co., has just introduced a new paper known as Zanzibar Laid, which is quite distinctive. It is made in white and six unusual colors, and is suggested for direct mail work where an entirely different style is desired, the paper with its zig-zag laid effect and new colors lending itself to effects that are different. The sheet is made in light and heavy, and so far as is known there is nothing just like it on the market.

The Boston Paper Trade Ass'n will meet for the annual fall gathering at the Exchange Club, November 16th at 6:30. Robert H. Tait, big game hunter, hockey player, and war hero will speak on his native Newfoundland, using lantern illustrations and moving pictures. Franklin Collier, noted cartoonist, will be present to sketch leading personalities of the New

RHOADS LEATHER BELTING

Smooth Running
No Takeups

Two months after installing a 15-inch, 3-ply Tannate Belt on a variable speed digester the superintendent reported it as "doing fine." It had not been shortened. This he thought exceptional as previous belts gave considerable trouble.

The report says that the belt is so well balanced that at a little distance it is hard to tell whether it is running or not.

Such belt service is characteristic of Rhoads Tannate Leather Belting. Dependable, economical, strong gripping, and waterproof; often showing increase in output and consequent lower cost of production.

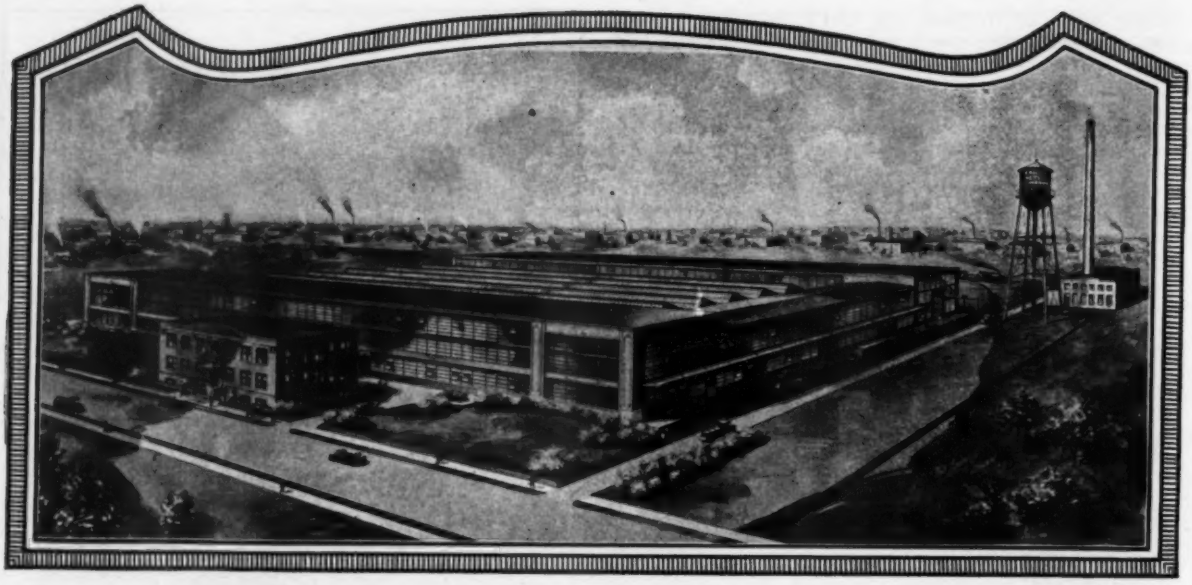
Keep Your Belts Young by Using
RHOADS LEATHER BELT PRESERVER
It Lubricates The Belt Fibres

J. E. RHOADS & SONS

PHILADELPHIA .....37 North Sixth Street
NEW YORK .....104 Beekman Street
CHICAGO .....324 West Randolph Street
ATLANTA .....70 South Forsyth Street
CLEVELAND .....1224 W. Ninth Street

Factory and Tannery: Wilmington, Del.

WE DESIGNED AND BUILT
The high pressure power plant
of
THE CHESAPEAKE CORPORATION
featured in this issue
THE
RUST ENGINEERING CO.
PITTSBURGH, PA.



Announcement

Unequalled facilities for the manufacture and service of power and industrial plant metering and control equipment is now assured by the Bailey Meter Company since it recently acquired the new factory building at 1058 Ivanhoe Road, Cleveland, Ohio, as shown above

The rapid growth and development of the field for metering and combustion control equipment as well as the leading part which the Bailey Meter Company plays in this field has necessitated its moving into larger quarters for the third time since 1916 to keep pace with the demand for Bailey Products.

The business this company has enjoyed for the past eleven years is ample proof of the high quality of its products and the efficient service which it has rendered—and will continue to render.

Bailey Sales—Service Engineers, Mechanical Engineers who have received a thorough training in fluid measurement, the principles of combustion and boiler control, are stationed in the branch offices of the company which are located in all the larger cities. These direct factory representatives are at your service to assist in solving your metering problems and to assist you in obtaining the best possible results from your metering equipment.

BAILEY METER CO.

1058 IVANHOE RD. CLEVELAND, OHIO.

Bailey Meter Company Limited, Montreal, Quebec.

England trade. President Norman Harrower who attended the June outing with his movie camera will probably have some surprising views for members.

Charles Sumner Bird, 72 years of age, prominent in paper manufacturing, politics and the civic life of New England, passed away recently. He entered the business of his father at East Walpole after graduation from Harvard in 1877. It was his active interest in the possible development of various lines that caused the company's expansion into all forms of paper cartons, and later into roofing products and floor coverings. The company grew from a small plant to its present size largely due to Mr. Bird's business acumen. Mr. Bird bequeathed about 40,000 shares of stock in the company to employees.

Herbert E. Fales

Herbert E. Fales, for 23 years treasurer of the Hollingsworth & Whitney Co., passed away suddenly at his home in West Newton, Mass. He was born in 1866 and his first employment was with the Hollingsworth & Whitney Co. During the 42 years of his service with that company he worked his way up from the bottom to a position as an officer of the company.

Mr. Fales was well known and active in various charitable organizations. He is survived by three sons and a daughter.

An interesting method of stimulating sales is being tried by the Northern Paper Mills of Green Bay, Wis., who are conducting a contest between D. F. Munroe Co., their Boston sales agents, and the B. F. Bond Co., of Baltimore, with $300 cash prizes as the awards. The company that shows the largest percentage of increase in sales over the first seven months of the year during the period from September 27 to December 15 will be the winner.

C. Irving Ware of Holyoke, vice-president and superintendent of the Holyoke Bar Co., died on October 18th from injuries received in an automobile accident. He was born in 1877 and was connected with the Bar Company for 25 years. He was the third member of his family to have held the vice-presidency of the business, and was exceedingly well known in the paper mill circles.

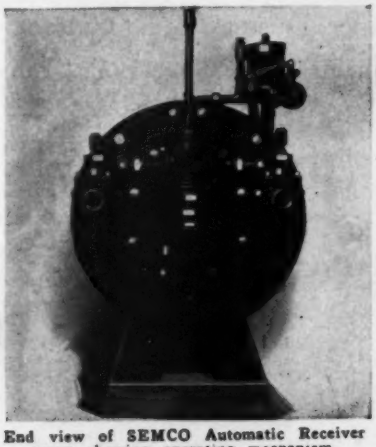
Cancellation of l.c.l. commodity rates by New England carriers to conform with Southern Classification proposals on rates from New England to the South, was vigorously opposed at a hearing in the rooms of the New England Freight Ass'n at Boston Oct. 17th. It was pointed out that existing paper rates in carloads were in the nature of commodity tariffs, but that no provision was made for a Class A tariff in the new Southern proposals. Various industries appeared in opposition; A. A. Raphael for the New England Paper & Pulp Traffic Ass'n; A. P. Lane of the Great Northern Paper Co.; and F. J. Dowd of the Associated Industries represented the paper industry.

Charles A. Rideout, president and treasurer of the Henry K. Barnes Co., passed away recently at the age of 56 years. Mr. Rideout was well known to the paper trade throughout New England.

At a meeting of the Keyes Fibre Co. stockholders, it was voted to lease a large part of the Bath Iron Works property acquired in the recent reorganization of the Keyes Fibre Co., to a shipbuilding concern.

The manufacture of chlorine for bleaching rags, paper and pulp is an industry that may soon gain a foothold in Holyoke. President Robert E. Barrett of the Holyoke Water Power Co., states that his company is considering the conversion of a power plant formerly the property of the Holyoke Street Railway Co., on Berkshire street. Experts from Boston have been examining the property and Mr. Barrett states his company will probably act on their recommendations. The plant

"Nothing Inside But the Float"



End view of SEMCO Automatic Receiver pump showing operating mecnanism.

SEMCO Automatic Receiver Pump

Advantages:

Stationary Receiver. eliminating trunions, bumpers, weights and dash pots.
All adjustments made at factory.
Piston controlled vent and pressure valves.
Quick action of valves eliminates wire draw.
Valve operating piston, float controlled.
Hercules heavy duty float eliminates float trouble.
All valves and operating mechanism outside.
As positive in its action as the steam engine.
Quick action, large capacity.
Cannot air bind.

for:

Pumping Your Condensate
Draining Your Dryers
Feeding Your Boilers

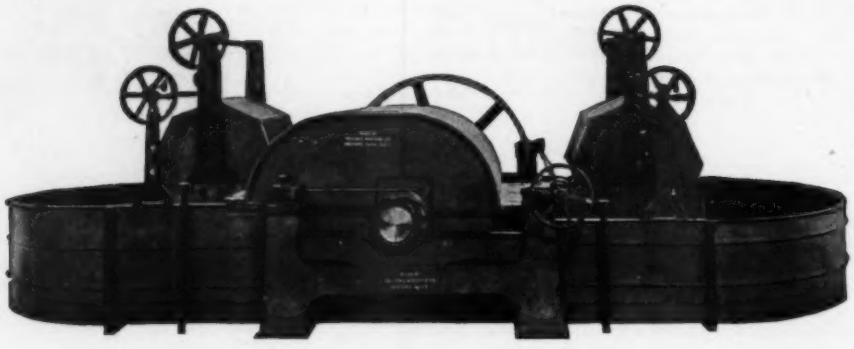
Operation:

The pump is designed so that steam or compressed air may be used to discharge condensate from receiver. As the receiver fills, the float within actuates an operating mechanism on the outside of tank which admits high pressure steam or air into receiver, thus discharging condensate. Only such pressure is used to discharge condensate as is required to force it out of receiver. When the volume of the condensate has been lowered to the sealing level, the float again actuates the operating mechanism closing pressure valve and discharging pressure within the receiver, thus allowing receiver to refill.

Stebbins Engineering & Mfg, Co.

WATERTOWN, N. Y.

Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors, Super-Calenders, Platers, Cotton and Paper Rolls.



The True Test of Your Money's Worth

when buying Wood Pulp
and Paper Mill Machinery

After all, experience is a great teacher. Absolute adherence to high standards is back of a good reputation. Engineering skill based on years of contact with everyday, big-and-little problems of the mill man makes real, understanding Service possible.

Today, as during the past 65 years, the Holyoke Machine Company delivers full value because it builds Quality and Superior Performance into every HOLYOKE machine.

The HOLYOKE MACHINE COMPANY

FOUNDED 1863

Expert Designers and Manufacturers of
WOOD PULP *and* PAPER MILL MACHINERY
PRINCIPAL OFFICES *and* SHOPS *at* HOLYOKE, MASS.

would produce chlorine by electrolyosis of common salt. The power house has been stripped of all equipment except boilers but could be re-equipped and put into operation.

NORTHERN NEW YORK NEWS

Glens Falls Mill Shuts Down

The South Glens Falls mill of the International Paper Co., once the leading mill of the entire international group, shut down on Oct. 10, throwing 180 employees out of work. It is reported the shut-down is indefinite. Some of the machinery will be junked and the rest will be shipped to other plants. The buildings now used for the making of paper will be used for the manufacture of veldown, a fabric product. The Veldown Co. is a subsidiary of the International.

The shut-down is said to be due to the scarcity of pulp wood in the Hudson River valley. Canadian wood is too expensive to import and there is no supply near at hand. The South Glens Falls mill was one of the original plants of the International Paper Co. which was organized in 1898, and was purchased from the Glens Falls Pulp and Paper Co. Some of the employees worked for the old company 40 years ago. At the peak of the company's business several years ago, 160 tons of paper were produced daily with six machines in operation. At that time, it had the greatest output of any paper mill in the world. During the last year the average has been 75 tons a day which was the greatest amount in some time. Prior to 1923, the average output was 60 tons.

For the period ending Sept. 30 the pulp wood shipments on the St. Lawrence river amounted to 315,000 cords, which is 11,000 cords in excess of the entire shipments of 1926. Navigation is expected to be open until at least Dec. 1, probably later, and pulp wood shipments will come up the river until the close of navigation. All the pulp wood comes from lower Canada and much of it is unloaded at Waddington and Odensburg for Northern New York mills.

Changes in Knowlton Mill

Five employees of the Knowlton Brothers Paper Co. have recently taken over the stock of Robert L. Pease, who has sold his holdings in the Knowlton company to become associated with the Brownville Paper Co. The men who have become stockholders are A. G. Wightman, superintendent of the mill; E. W. Clarke, buyer and assistant to Mr. Wightman; Oren Summerville, who is connected with the sales department, and Raymond T. Boutilier, an accountant in the mill. James C. McCormick, treasurer of the company, also purchased some of the stock of Mr. Pease.

Mr. Pease, who came to Watertown from Kalamazoo, Mich., was vice-president of the Knowlton organization. He recently purchased the stock owned by George F. Clark in the Brownville Paper Co. Mr. Clark retires from active business, and expects to spend the winter in Florida.

A peculiar case involving the paper industry has come before the state compensation court. Sherman Gibbs of Turin claims compensation for alleged poisoning which he received while unloading a carload of crude sulphur for the Gould Paper Co., Lyons Falls. Gibbs claimed that handling the sulphur resulting in a skin infection. The carrier contended that ailment of this kind was not covered under the compensation law. The case was put over pending the securing of medical testimony.

The International Paper mill at Pyrites has started another papermaking machine for the manufacture of Rangley print. This is made by a new process and requires a higher percentage of clay. It gives a slightly higher finish than ordinary newsprint and is used where exceptionally fine cut work is desired. Shortly after the International purchased the DeGrasse mill, operations were discontinued on No. 1 and

Dependable Wire Clothing

Every possible precaution is taken to make sure that Cheney Bigelow Wire Clothing shall be dependable.

Only the highest grade materials are used. The wire is drawn with precision and very carefully annealed, it is frequently tested for quality and size.

The weaving is extremely accurate, the finished cloth is uniform and firm, and always inspected with minutest care before shipment.

For Fourdrinier or Cylinder machines Cheney Bigelow Wire Clothing is always dependable.

Cheney Bigelow Wire Works

Established 1842

Springfield, Mass.

CENTRIFUGAL STOCK PUMPS BROUGHT UP TO DATE

PERFORMANCE

Successfully Handle Heavy Stock

EFFICIENCY

Capacity and Efficiency About As Good As When Pumping Clear Water.

MECHANICAL DETAILS

Many Improvements Making for Longer Life and Easier Maintenance. Get a Quotation on One of these Better Stock Pumps and Compare the Horse-Power Required with What Your Present Stock Pumps Are Using.

ALLIS-CHALMERS MANUFACTURING CO.
MILWAUKEE, WIS. U.S.A.

PORTLAND, OREGON

Is the ideal location for that new Pulp and Paper Mill of yours.

Portland is in the heart of the big timber region of the Pacific Northwest. Has an abundance of good water together with a plentiful supply of cheap hydroelectric power for manufacturing purposes. Good ocean and railway shipping facilities, a mild climate, and a fair supply of skilled labor, practically all of which is non-union.

I would be pleased to serve you in the location, design and construction of that new mill of yours.

HENRY BLACK

Complete Building Construction

383 Pittock Block - - - Portland, Oregon
Telephone Broadway 8060

Iron Workers, Cement Workers, Bricklayers, Carpenters, Roofers, Plumbers, Electricians, Cabinet-makers, Painters and Paperhangers; also Real Estate Bonds and Mortgages

ALBANY GREASE

TRADE MARK

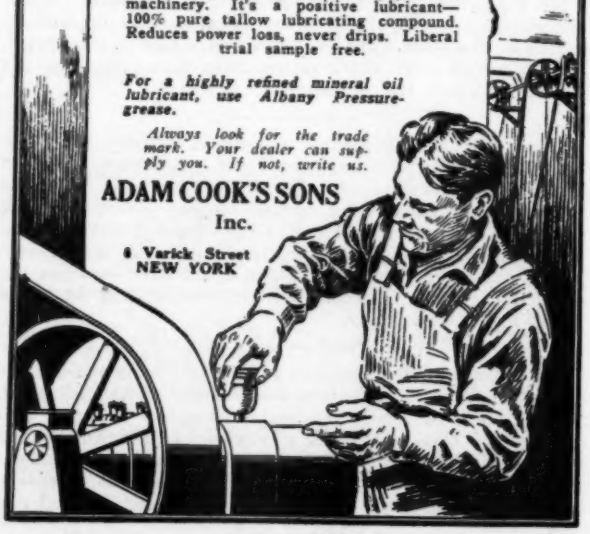
SPECIALLY FOR PAPER MILLS

For 59 years Albany Grease has been used for lubricating expensive paper mill machinery. It's a positive lubricant—100% pure tallow lubricating compound. Reduces power loss, never drips. Liberal trial sample free.

For a highly refined mineral oil lubricant, use Albany Pressure-grease.

Always look for the trade mark. Your dealer can supply you. If not, write us.

ADAM COOK'S SONS
Inc.
6 Varick Street
NEW YORK



2 machines, only the two larger machines being operated. No. 1 is being used for the Rangley process and it is expected that No. 2 will soon be placed in operation. A. W. Driscoll, former superintendent of the International mill at Livermore Falls, Me., is the new mill superintendent.

John C. Monty, who for the past year has been in charge of the Norwood, Norfolk and Raymondville mills of the St. Regis Paper Co., has resigned. Mr. Monty came to Northern New York from Maine where he was employed by the Great Northern Paper Co.

Amos W. Simpson, who has been acting manager of the DeGrasse Paper Co. plant of the International Paper Co., has gone to Newfoundland to take up his duties with the Corner Brook plant of the International. Mr. Simpson had been at Pyrites 14 years.

A banking group composed of F. L. Carlisle and Company, Inc., E. H. Rollins and Sons, Hornblower Weeks and Schoellkopf, Hutton and Pomeroy, Inc., is offering at 102 and dividend to yield 6.86 per cent, a new issue of $2,739,900 seven per cent cumulative preferred stock of the St. Regis Paper Co. The stock which is preferred as to assets and dividends over the common stock, is redeemable as a whole, or in part, on any dividend date 30 days' prior notice at $110 a share and accrued dividends.

The court has refused to cut the assessment of the property of the International Paper Co. in the town of Brownville. The company contended that the assessments were excessive.

A. W. Bronk has been named superintendent of the Champion Paper company of Carthage, a subsidiary of the St. Regis Paper Company. Mr. Bronk comes from Bellows Falls, Vt., where he has been with the Moore and Thompson company. He is considered to be an authority on kraft paper. Herbert Hall, who has been at the Norfolk mill of the company, will succeed J. C. Monty who recently resigned as superintendent of the upper group of the mills, located at Norfolk, Norwood and Raymondville. E. B. Cole, who has been superintendent of the Champion mill has been transferred to the superintendency of the Norfolk mill.

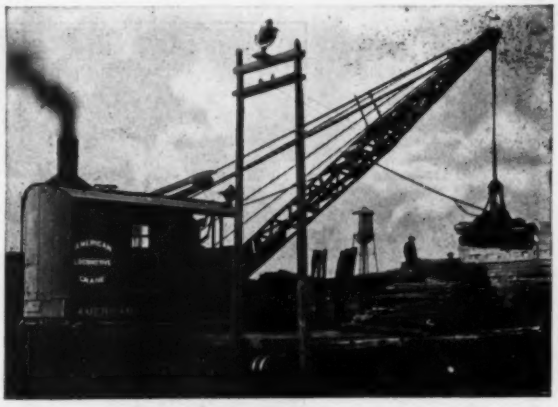
Northern New York paper manufacturers will benefit by the cut in the freight rates on soft coal. A cut of 30 cents a ton on bituminous is ordered, saving about $75,000 a year in this section. The new rate is $3.04 a ton. The paper companies that joined in filing the complaint were: St. Regis Paper Co., Champion Paper Co., National Paper Products Co., Taggaret Brothers, Inc., Harmon Paper Co., Warren Parchment Co., West End Paper Co., Brownville Board Co., Brownville Paper Co., Gould Paper company, Knowlton Brothers, Sherman Paper company, Diana Paper company, and DeGrasse Paper company. J. A. Quinlan, traffic manager of the St. Regis Paper company, represented the complaining companies before the interestate commerce commission.

Thomas L. Dunbar of the Stebbins Engineering company has patented a method and apparatus for the treating of fibrous materials. The patent has been assigned to the Stebbins Co. The invention is described officially as follows: "In a chemical pulping process, heating fresh liquor to a predetermined temperature, then pumping the same into a digester during the cooking process to build up a relatively high pressure in the digester, and maintaining a relatively low temperature in the digester while creating said pressure."

E. H. Lundgren Made Vice-President

Edwin H. Lundgren, for the past four years general sales manager of the Combustion Engineering Corp., has recently been elected vice-president and general sales manager.

Mr. Lundgren is well known in the power plant field, having been actively identified with the stoker business for a number of years. He was formerly vice-president and chief



An "American" Locomotive Crane Should Pay for Itself in from 2 to 3 Years

An "AMERICAN" Locomotive Crane in use at the average paper or pulp mill should pay back its cost in from 2 to 3 years. In addition to unloading, piling and rehandling all pulp wood it will find time to unload coal with a clamshell bucket and do all the miscellaneous heavy handling that comes up.

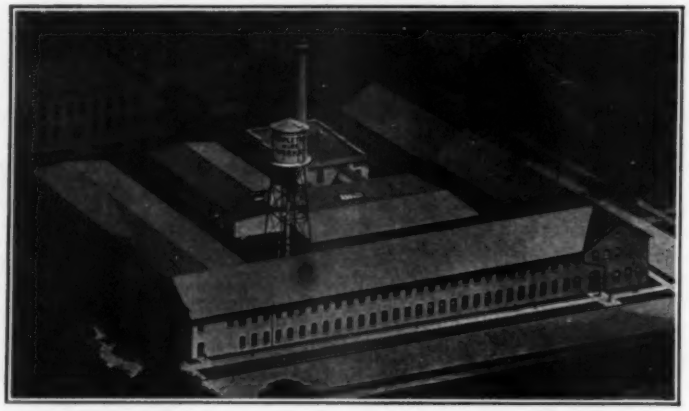
Its ability to switch cars is an especially valuable and money-saving feature. The "AMERICAN" Automobile Type Transmission insures smooth, powerful traveling even over bad track. The traveling gears are all enclosed in cast steel gear cases to keep out dirt and grit. Gears run in a bath of oil.

The "AMERICAN" Locomotive Crane is so accurate and easily controlled that with its 50-foot boom it can pile three tiers of 8-foot wood on each side of the track to a height of 30 feet and as straight as if piled by hand.

The crane shown above is one of two "AMERICANS" in use at the plant of the Wausau Sulphate Paper Co. at Mosinee, Wisconsin.

Ask for the "AMERICAN" Locomotive Crane Book and the "Five Star Points" Booklet.

AMERICAN
HOIST & DERRICK CO.
Saint Paul, Minn.
New York, Chicago, Pittsburgh, Seattle, St. Louis, New Orleans.



APPLETON WIRES

Fourdrinier Wires
Cylinder Wires
Save-All Wires
Washer Wires

Dandy Rolls and Cylinder Moulds repaired and recovered.

Over fifty years of experience in manufacturing wires for American Paper Makers, and the ever increasing use of APPLETON WIRES testify to their quality.

Appleton Wires
are good wires

APPLETON WIRE WORKS INC., APPLETON, WIS.

engineer of the Frederick Engineering Co., Frederick, Md. Mr. Lundgren is a graduate of the Swedish Government Technical College, and is an authority on the design and construction of stokers. He is also the author of numerous technical articles.

A scarcity of lumber jacks is reported in the Adirondacks and paper and pulp companies are finding a hard time recruiting crews for the annual cutting. The companies are already trying to get their crews together although almost summer weather still prevails and they are finding it hard work.

The complaint of the St. Regis Paper Co. alleging excessive freight rates on newsprint will be held in Watertown Nov. 21 before Examiner W. H. Smith of the Interstate Commerce Commission. The complainant alleges that the rates on newsprint from Watertown to destinations in the northeastern part of the United States are excessive.

Fred B. Chappell

Fred B. Chappell, manager of the Glens Falls Machine Works, Glens Falls, N. Y., passed away at his home in Glens Falls October 25th.

Mr. Chappell was born in 1880, and had been associated with the Glens Falls Machine Works for the past 20 years. He is survived by the widow and one daughter.

NEW YORK CITY NEWS

Paper Mill Supply Dealers Meet

Members of the New York Association of Dealers in Paper Mill Supplies, Inc., held an interesting meeting on the evening of October 12, at Conte's Restaurant, 432 Lafayette St., New York. This, incidentally, was the first meeting of the organization following the adjournment for the summer vacation season. The meeting was devoted chiefly to the rendering of reports by the various association committees concerning their work during the summer.

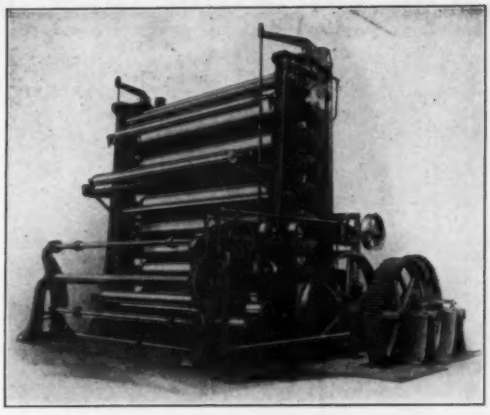
The railroad committee, through its chairman Walter H. Martens, reported that work was going ahead in an effort to have freight rates on waste paper shipments from the East to the Middle West reduced, and that it had secured the cooperation of the Merchants' Association of New York in this connection. Announcement was made at the meeting that the annual banquet of the association would be given as usual in February during Paper Convention Week in New York, and a committee was appointed to take charge of the souvenir journal to be issued for the occasion. The annual ladies' night dinner and dance of the association will be given on the evening of November 5 in the South Garden of the Hotel Astor.

I. P. Acquires George & Sherrard Co.

Announcement is made from the headquarters of the International Paper Co., that this company has recently acquired, through the medium of the International Securities Co., the entire capital stock of the George & Sherrard Paper Co., of Wellsburg, W. Va., manufacturer of rope papers and paper shipping sacks. It is estimated that the present equipment of the newly acquired company will produce about 20,000,000 bags per year.

The George & Sherrard Paper Co., it is stated, will be operated as formerly with no change in personnel, though under the control of the International Paper Co.

The Certain-teed Products Corp., manufacturers of roofing and flooring paper and other products, reports a net income of $721,144 for the third quarter of 1927 after all charges and taxes, against $672,098 in the same period of last year. For the first nine months of the current year net income was



INVESTIGATE

The Advantages of

NORWOOD FINISHING MACHINERY

YOU'LL FIND it profitable to thoroughly investigate the advantages of Norwood Finishing Machinery. Take Norwood Super-Calenders for instance—and particularly notice their common sense feature and exclusive advantages.

Notice that the frame uprights have tee slots the entire height, so you can fasten platform brackets and other calender attachments at any height. Consider the important time saving advantage of being able to remove any roll without removing the calender caps. Make a mental note of the added durability assured by a practical continuous oiling system. Take into consideration the value of the compound lever type pressure device and the power operated revolving reel which is controlled by a three push button station conveniently located for the operator.

These are a few of the many important advantages and improvements to be found in Norwood Super-Calenders. They are typical of the advanced engineering developments to be found in all of Norwood's machines and equipment.

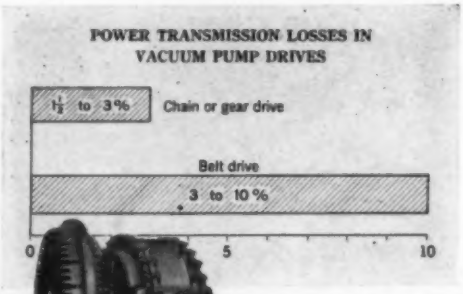
It will pay you to write us for full specifications, illustrations and prices on any paper mill equipment in which you are interested.

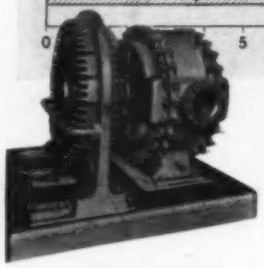
NORWOOD ENGINEERING COMPANY

FLORENCE, MASS.

FILTERS SUPER-CALENDERS GLASSINE-CALENDERS PLATERS DUSTERS BRUSHING ENGINES

You can avoid these power losses by direct driven Nash pumps





Nash Hytor Vacuum Pump, direct connected to slow speed synchronous motor.

Experience shows that the power transmission losses for a chain or gear driven vacuum pump are generally from 1½ to 3%. And from 3 to 10% for a belt drive. The one way to avoid these losses is to install Nash Hytor Vacuum Pumps, which *can be direct driven by slow speed synchronous motors.*

The efficiency of these synchronous motors in the smaller sizes, is practically equal to that of the high speed induction motor, neglecting belt losses. In the larger sizes, 300 h.p. and higher, the efficiency of the synchronous motor is higher. This statement takes into account the losses in the motor driven exciter which is supplied with the synchronous motor.

NASH ENGINEERING COMPANY

161 Wilson Road So. Norwalk, Conn.

New England Representative
Mr. G. H. Gleason, Nottingham Bldg., Copley Square, Boston, Mass.

Western Representative
Mr. T. H. Savery, Jr., 80 E. Jackson Boulevard, Chicago, Ill.

Nash Hytor
VACUUM PUMPS AND COMPRESSORS

Longcrimp Fourdrinier Wires

USED EXTENSIVELY ON
Kraft, Wrapping and Newsprint Machines

Give Longer Average Service than the Regular Weave

Made By

The Lindsay Wire Weaving Company
(Collinwood Station) CLEVELAND, OHIO

See page 382 in the 1927 Paper and Pulp Mill Catalogue

$1,846,717, equal to $4.85 a share on the common stock after first and second preferred dividends, against $1,792,518 or $4.65 a share earned in the similar time of 1926.

The International Paper Co., has called for redemption on December 1, at 102½ and interest, all its 15-year six per cent convertible gold debentures which will be outstanding at that time. About $13,700,000 of these debentures have been converted, and $10,000,000 recently were called for redemption on October 1. The original issue, sold in 1926, amounted to $25,000,000. Rights to convert the debentures into cumulative seven per cent preferred stock and at the same time to purchase two common shares at $40 each for each $1,000 of debentures converted, will extend to the date of presentation of the debentures for redemption.

Ralph H. Fales, who for several years was with Linton Bros. & Co., one of the best-known and oldest manufacturers of bristols and indexes, has been appointed sales manager for Allan & Gray, paper merchants, 54 Beekman St., New York. Mr. Fales is well known to the trade and is fully qualified for his new duties.

Edward W. Scarborough, widely known in the paper trade and head of the firm of E. W. Scarborough Co., paper jobbers of 28 Beekman St., New York, died at his summer home in Thompson, Conn., on Oct. 17. Mr. Scarborough was in his seventieth year and for half a century was actively engaged in the wholesale paper trade in this city. He was born in Cincinnati, O., and for many years was a resident of Brooklyn, N. Y. He was a veteran of the Seventh Regiment. A son, a daughter and three brothers survive him.

Colonel Edgar Smalley, who is an annual visitor to America and a director of E. Butterworth & Co., Inc., dealers in papermakers' supplies of New York and Boston, has succeeded the late William F. Dodge as managing director of Edwin Butterworth & Co., Ltd., of Manchester, England. Colonel Smalley is well known to American paper manufacturers.

The Rogers Paper Manufacturing Co., manufacturer of high grade paper board and insulating papers of South Manchester, Conn., has declared an initial quarterly dividend of 90 cents on its no par common stock, thus placing it on a $3.50 annual basis.

Announcement is made that Arthur Rosenfeld, formerly in charge of the paper stock department of Maurice O'Meara Co., of New York, is now associated with William Steck & Co., Inc., 15 Park Row, New York, dealers and importers of paper mill supplies.

E. J. Keller, president of the E. J. Keller Co., Inc., 200 Fifth Ave., New York, importers of wood pulp and other papermakers' supplies, has returned from a business trip to Europe.

The Paperboard Industries Association will hold its annual meeting at the Waldorf-Astoria Hotel, New York City, November 16 and 17, 1927. Officers will be elected and plans outlined covering the work to be undertaken during the coming year.

H. N. Spicer, of the Dorr Co., New York, accompanied by Mrs. Spicer, has left for Australia, China and Japan to be gone for several months looking after his company's interests in those countries.

Oakite Products Annual Conference

Oakite Products, Inc., will hold its annual conference in New York City, November 7 to 10, 1927. This completes the company's 19th year of industrial cleaning service. Field service men, technical staff and executives, together with field

RODNEY HUNT

Water Power Equipment

New Mill Type

Turbine Water Wheels

Accessory Equipment
including
Canal Gates
Hoists
Flumes
Trash Racks
Penstocks
Draft Tubes

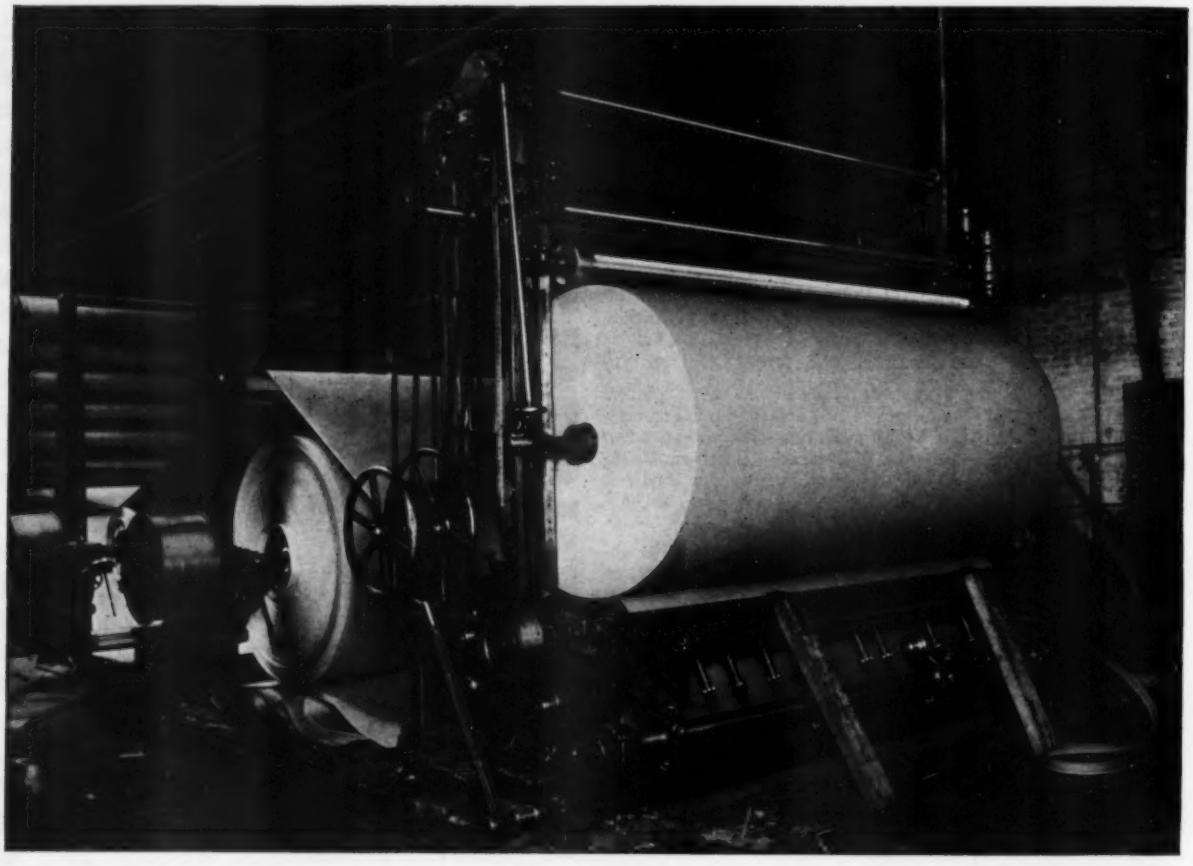
Send for Catalogues

Rodney Hunt Machine Co.
38 Lake Street, Orange, Mass.

Head Gates and Hoists

RODNEY HUNT

The Experience of 50 Years is of Value to You



110" Type "CA" Langston Slitter and Winder recently installed in mill of Container Corporation of America, Cincinnati, Ohio.

For good corrugating rolls

EVERY corrugator knows full well how important it is to have rolls that are tight and of uniform density. The making of rolls that meet these conditions presents no difficulty whatever in mills that use the Langston Slitter. With the Langston winding principle it is a simple matter to wind rolls that are tight from the very first wrap, and the desired tightness can be maintained right up to the maximum diameter, which means uniform density.

Another important Langston advantage: The Langston Shear Cut insures rolls absolutely free of dust. Trouble due to dust or lint clogging the silicate system can never occur when the rolls are made on a Langston.

Is it any wonder that so many mills that supply rolls for use in corrugators as well as on solid fibre pasters or in other converting operations, use Langston Slitters!

A FEW of the mills making rolls for corrugating on Langston Slitters are:

Robert Gair Company,
(6 *Langstons*)

Container Corp. of America,
(6 *Langstons*)

Kieckhefer Container Co.,
Brown Paper Mill Co.,
(4 *Langstons*)

National Paper Products Co.,
(3 *Langstons*)

American Boxboard Co.,
(2 *Langstons*)

Terre Haute Paper Co.,
(3 *Langstons*)

SAMUEL M. LANGSTON COMPANY, CAMDEN, NEW JERSEY
A. H. Cox & Co., Inc., Seattle, Washington

CLEAN SHEAR CUT CUT

LANGSTON SLITTERS

representatives from 36 states and Canada, will discuss mutual problems and exchange experiences in connection with their work which ranges from the cleaning of phonograph needles to locomotives, and silk shirts to submarines.

At this conference, a number of technical papers will be presented dealing with industrial cleaning and methods best adapted to various industries.

OHIO NEWS

Superintendents Meet with Printers

Joint memberships of the Miami Valley Division of the Pulp and Paper Mill Superintendents Ass'n and the Miami Valley Printers' Ass'n not only established an interesting precedent at their initial meeting together at Hamilton, Ohio, Saturday, October 29, but they had the distinction of being the first convention gathering in Hamilton's new hotel, the Anthony Wayne. The meeting of paper men and printers brought to conclusion a week of formal activities officially opening the new hostelry.

Superintendents from the Miami Valley and others from Pennsylvania, Indiana and other states were present at this afternoon and evening meeting, the first of its kind in the history of the paper men and the printing craftsmen. Fully 125 were numbered in the gathering.

In the afternoon, H. H. Latimer, superintendent of the Beckett Paper Co. and chairman of the division of paper mill superintendents, presided as chairman. N. A. Altman, of the Butler Paper Co., Chicago, led a spirited discussion on "The Treatment of Paper," "Printers Ink," "Printing Rolls," and "Complaints from the Printers." He spoke convincingly of the way to control paper conditioning, stressing the fact that the most important factor in the shipping of paper from country to country is the question of moisture.

Minor Beckett, president of the Beckitt Paper Co., was another speaker of the afternoon, giving the history of paper mills in the Miami Valley.

A friendly spirit pervaded the banquet hour, making this one of the most enjoyable occasions the company has ever enjoyed, according to the popular opinion of the evening's entertainment. Mr. Latimer, acting as toastmaster at the banquet, carried out the banquet details graciously and pleasantly.

A treat for the guests was given in hearing L. D. "Derbs" Post, veteran editor and publisher of the Paper Mill and Wood & Pulp News, who has edited that publication for half a century, thereby establishing a record in trade journalism. His speech was most congratulatory to the joint gatherings for their fine representation and he reviewed the history of the paper association of the past eight years in which they have grown to 600 members.

Carl Greer, advertising manager of the Beckett Paper Co., was another interesting speaker, taking as his subject, "Making Broke." He gave some historical sidelights regarding the spot on which the new hotel now stands, in the shadow of old Fort Hamilton on a high point above the Miami River.

Other speakers were A. Rolfe, of the Champion Coated Paper Co., R. L. Eminger, National Secretary of the Association and R. D. Weatherby, president of the Springfield Printers' Ass'n.

It was suggested that the joint meetings be made an annual occurrence looking toward making them monthly later on.

Chillicothe Paper Co. Building Addition

Without any shut-down of the present plant, the Chillicothe Paper Co., Chillicothe, O., is building an addition to its factory which will give it an additional capacity of 40 tons a day of high-grade book, bond, ledger and writing paper. The extension is expected to be finished and machinery installed ready for operation by the first of the year.

The general contract for the design and erection of the building extension and also the contract for heating, wiring, lighting, plumbing and sprinklers were awarded to the H. K.

PERKINS HOLYOKE

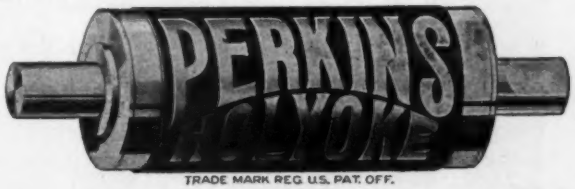
Calender Rolls

More than Fifty Years Successful Service

Since 1873, Perkins Calender Rolls have been known with favor to the paper industry. They have been designed and built to meet the exact requirements of paper makers. Perkins Calender Rolls have marked individuality because of special methods of manufacture that these long years of service in this field have developed. Perkins Calender Rolls are uniform, resilient and resistant, the three essentials most important to the paper manufacturer.

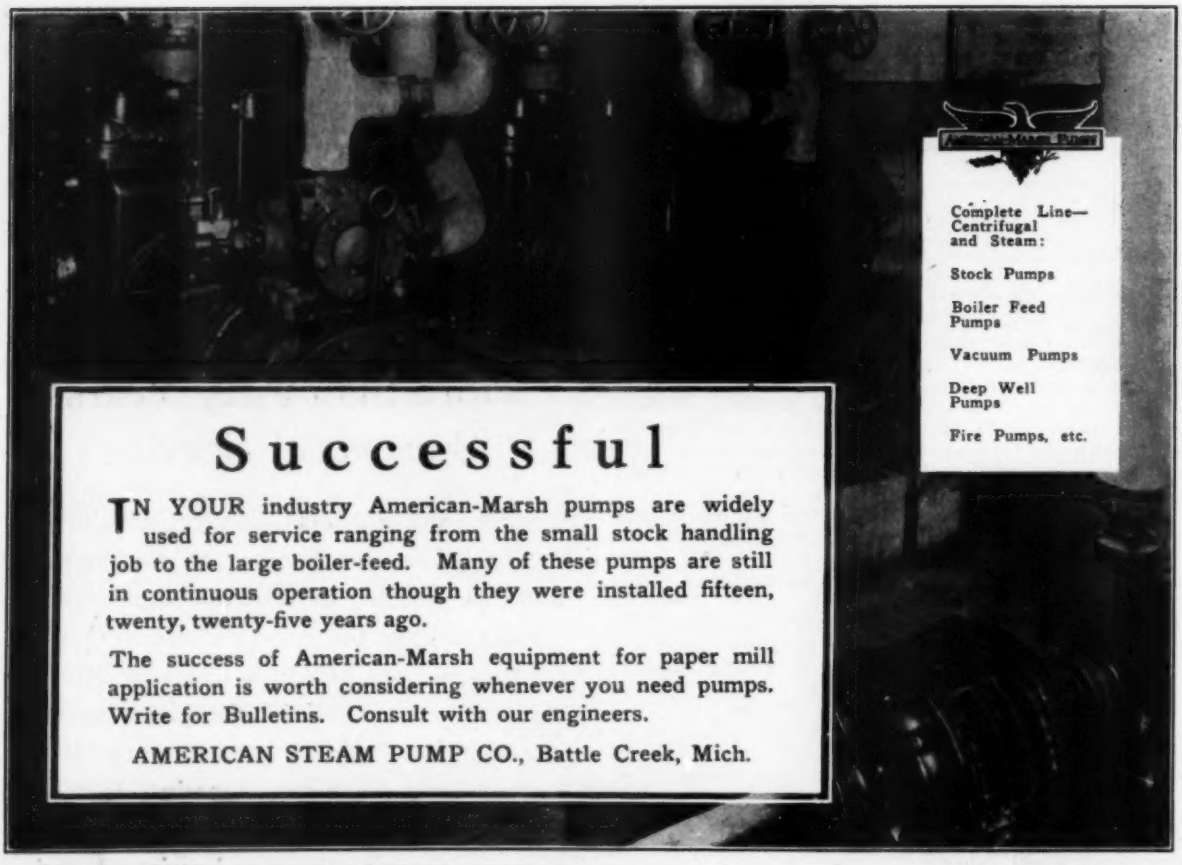
Perkins Calender Rolls stand heat better and wear longer. They are made in the world's largest Calender Roll plant in which have been developed special mechanical processes for preparing filler stock, which means uniform and long life to the product.

B. F. Perkins & Son, Inc., Holyoke, Mass.



TRADE MARK REG. U.S. PAT. OFF.

COTTON ROLLS - PAPER ROLLS - EMBOSSING ROLLS - CHILLED IRON ROLLS - GRANITE PRESS ROLLS - WEB SUPERCALENDERS - GLASSINE SUPERCALENDERS - FRICTION CALENDERS EMBOSSING CALENDERS - SHEET CALENDERS - PLATERS - MULLEN PAPER TESTERS TENSILE TESTERS - VENTILATING FANS - RAG CUTTERS - STOCK CUTTERS - PAPER DAMPENERS BLEACH EJECTORS



Complete Line—
Centrifugal
and Steam:

Stock Pumps

Boiler Feed
Pumps

Vacuum Pumps

Deep Well
Pumps

Fire Pumps, etc.

Successful

IN YOUR industry American-Marsh pumps are widely used for service ranging from the small stock handling job to the large boiler-feed. Many of these pumps are still in continuous operation though they were installed fifteen, twenty, twenty-five years ago.

The success of American-Marsh equipment for paper mill application is worth considering whenever you need pumps. Write for Bulletins. Consult with our engineers.

AMERICAN STEAM PUMP CO., Battle Creek, Mich.

How About Your Cutter Drive?

INSTALLATION AT MICHIGAN CARTON CO.
No. 14, class "D" LEWELLEN Transmission driving Black-Clawson cutter at the Michigan Carton Company. Machine speed—50 to 250 F.P.M. Sheet length—16½" to 82½" at any speed.

The LEWELLEN Transmission enables you to cut sheets of uniform length at all times. We furnish blue prints showing complete installation at your mill, including pulley sizes, location of transmission, etc.

LEWELLEN MFG. CO.
Columbus, Indiana

This User Says:

"As you know, the real reason for installing the LEWELLEN Transmission was to overcome the trouble we were experiencing with the variation in length of sheets on our cutter.

We are very pleased to advise you that the LEWELLEN Transmission has given very satisfactory results and we have not been able to find a sheet that varies in length a full one-eighth of an inch. Due to the sturdy construction of your drive it operates without variation and from a mechanical standpoint this shows correct designing for a long-life machine.

Taking these things into consideration was the reason we mailed you an order for a second LEWELLEN drive on our other machine."

LEWELLEN
Variable Speed
TRANSMISSION

Ferguson Co. of the Hanna Bldg., Cleveland. Plans were prepared by Ferguson engineers under the direction of E. P. Bearce, vice-president and chief engineer of the Chillicothe Paper Co., in conjunction with designers of the machine which is to be installed.

The extension is a two-story concrete and steel structure, divided by fire-proof walls into beater room, machine room and finishing room. The wall between the new and old buildings is to be removed above the second-floor level. The beater and machine room extension is 40 by 468 ft., and the finishing room 75 by 109 ft., with an 8-foot railroad loading platform at the second-floor level. The plant will have shipping facilities on two railroads, the B. and O. and Norfolk and Western.

A roof deck of slow-burning wood construction is supported by a steel frame. The roof lumber is creosoted in the machine and beater rooms as a protection against rot and decay. An overhead runway is provided in the machine room for a hand-operated crane having two five-ton hoists to serve the machine.

Considerable time was saved in construction of the plant by placing the ground floor slab before the floor deck was built.

The Rice, Barton and Fales Co. of Worcester, Mass., is installing the 154-inch machine. The wire will be 154 inches wide, giving a trim of about 140 inches. The fourdrinier will be of the removable type, which will include a reel for stringing the wire after the fourdrinier frame is moved out. All bearings on this part of the machine will be anti-friction. The machine will have three presses, 24 60-inch dryers, two calenders, pope reel and Warren winder. It will be operated by a single motor drive through spiral bevel gear stands, equipped with magnetic clutches, which will be controlled by push button stations at convenient points on the tending side of the machine. All constant line equipment will be direct connected to individual motors.

Officers of the Chillicothe Paper Co. are Hector McVicker, president; E. F. Bearce, vice-president and chief engineer; and Austin Storey, treasurer.

Geo. H. Mead of Dayton, O., is serving as chairman of the board which is conducting the merger of the Abitibi Power and Paper Co., Ltd., the Spanish River Pulp and Paper Co., Ltd., St. Anne Paper Co., Ltd., the Murray Bay Co., Ltd., and other concerns, which will form a huge combination of Canadian paper manufacturing interests. The completed plans will give the Abitibi Co. a capacity of 650,000 tons of newsprint annually, with resources sufficient to increase this capacity to 1,000,000 tons as market conditions warrant.

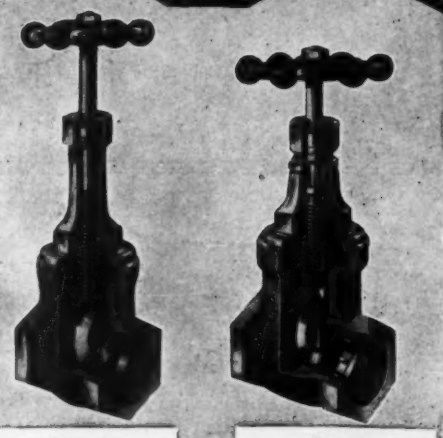
Norman Sullivan has been appointed successor to Owen Tresslar as director of the Miami Valley Pulp and Paper Shippers' Ass'n. The bureau was established a few months ago for the purpose of pooling less than carload shipments into carloads for the mutual benefit of members of the association. The plan has proved very successful.

Z. W. Ranck, president of the Crystal Tissue Paper Co., Middletown, O., is planning an interesting trip for a period of several months. He will be accompanied by his family and their itinerary will take them to points in Europe and Northern Africa. Upon their return to Italy, they will take aeroplane trips over the countries they have visited.

C. H. Randolph, Middletown, O., formerly an official of the Advance Bag Co. and later connected with the Lawrence Bag Co., will leave soon to make his home with his daughter in Hawaii. Mr. Randolph is well known in the paper industry, as in earlier days he was interested in the manufacture of paper.

Scrap paper shipped from the Oxford, Conn., plant of the Diamond Match Co., to Middletown, provoked a "scrap" before the Interstate Commerce Commission when that company filed a complaint that it had been forced to overpay freight rates to the amount of $487.30 in 1921 and 1922. Reparation is demanded by the company, which asserts that the rate from

UNFAILING PERFORMANCE
A Built-in Characteristic



Bronze
Double Disc Gate Valve
150 lb. W. S. P.

Bronze
Wedge Disc Gate Valve
200-300 lb. W. S. P.

LUNKENHEIMER
BRONZE
GATE VALVES

have acquired an enviable reputation for long service records.

Just recently, a disc replacement order was received for a Lunkenheimer Bronze Gate Valve which has been in continuous service for over twenty-five years.

No other repairs were required during that extensive period, and the disc renewal made possible many more years of unfailing service.

Unusually long service life is taken as a matter of fact when "Lunkenheimer" is specified, and the satisfaction of the users is exemplified in the constantly increasing number of repeat orders.

Lunkenheimer Distributors are located in all industrial centers, and carry complete stocks. They will fill your requirements promptly.

THE LUNKENHEIMER CO.
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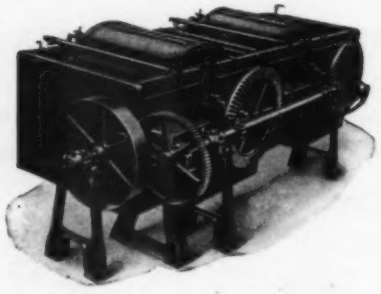


Bleached Sulphite Washer

TWO A. D. WOOD CYLINDER TYPE

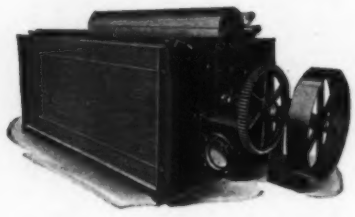
A high efficiency machine handling large capacity with low power and minimum upkeep.

Absence of couch or doctor and continuous self cleaning wire are important features in handling stock containing bleach liquor.

Simply and strongly constructed.

Our new collars ABSOLUTELY ELIMINATE losses by sealing straps. Furnished at nominal cost.

SEND YOUR ORDER AND GET THE BEST

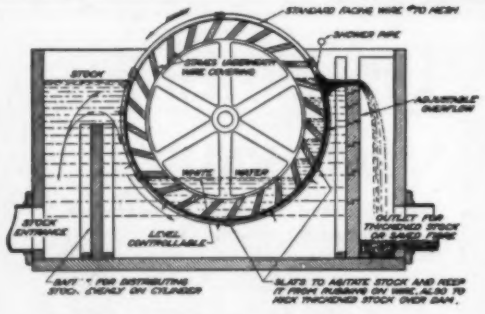


Decker and Decker Washer

We make many styles which are designed for various mill conditions and from an operating standpoint.

Our name on these machines gives you the assurance of many years of satisfactory performance.

The Walker Attachment is applicable to any model or to your present decker. It will increase their capacity 33% at negligible cost.


STANDARD FACING WIRE 70 MESH
SHOWER PIPE
STOCK
ADJUSTABLE OVERFLOW
WHITE WATER
STOCK ENTRANCE
LEVEL CONTROLLABLE
OUTLET FOR THICKENED STOCK OR SAVED FIBRE
BAFFLE FOR DISTRIBUTING STOCK EVENLY ON CYLINDER
SLATS TO AGITATE STOCK AND KEEP IT FROM RUBBING ON WIRE, ALSO TO MIX THICKENED STOCK OVER DAM.

A. D. Wood Save-all

The A. D. Wood Machine as a Save-all is unique.

New sealing collars and ease of patching the wire mean maximum efficiency.

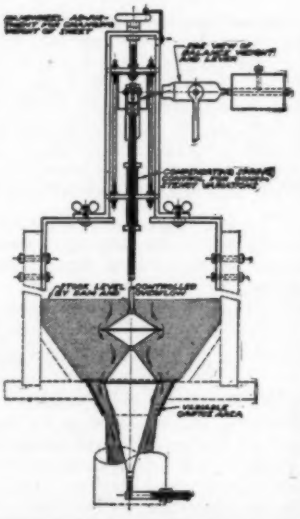
Simplicity, self-cleaning wire and continuous high capacity give satisfaction and greater savings.

We have reports of 90-95% efficiency for a four year period

Boivin Weight Regulator

FOR FOURDRINIER MACHINES

More than 50 already giving invaluable service on fast and slow speed machines, handling all kinds of stock. Install it, adjust to give desired weight, and leave it alone. Overweight claims eliminated, with big improvement in broke loss and running conditions. Handles capacities ranging from 15 to 150 tons with equal efficiency. Sensitive action and direct control.



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PULP AND PAPER MILL MACHINERY
GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

See pages 342 to 343 in the 1927 Paper and Pulp Mill Catalogue

Oxford to Middletown on scrap and waste paper was 44½ cents per hundred pounds in the two years it was overcharged. In 1922 the rate was reduced to 40.5 cents. The previous rates were unreasonable and unfair, it is claimed.

Z. W. Ranck, president of the Crystal Tissue Paper Co., Middletown, O., and M. H. Lund, also of that firm, attended the fall meeting of the Tissue Paper Manufacturers' Ass'n of America in Chicago, October 16, 17, 18. Mr. Ranck is president of that organization which embraces a membership representative of the tissue manufacturers of this continent.

A. W. Rawlings, formerly head of the carton division of the Gardner & Harvey Co., has become affiliated with the Lord Baltimore Press, Baltimore, Md. Mr. Rawlings is an efficiency expert and in the capacity of assistant to the president of Lord Baltimore Press will prove a valuable asset.

When the tribe of Blackfeet Indians visited Hamilton, O., Oct. 30, they adopted Harry T. Ratliff, of the Champion Coated Paper Co., as one of their number. The ceremonial took place on the special train on which the Indians passed through enroute from the Baltimore and Ohio Centennial Exposition in Baltimore, Md., to their reservation in Montana.

Tom Harvey, director of the Gardner & Harvey Paper Co., addressed the Middletown Lions Club, November 3, giving an interesting comparison of papermaking methods of today when the product is hardly touched by hands, and in its early stages when it was made entirely by hand.

The election of Robert W. Gillispie to vice-president and general manager of The Jeffrey Mfg. Co., was announced on Oct. 10, 1927. Mr. Gillispie, who for many years was connected with the Bethlehem Steel Co. in an executive capacity, joined the Jeffrey organization as vice-president and assistant general manager on July 1, 1926.

Wm. B. Fulton, general manager of the Fulton Engineering Co., Middletown, O., has just returned from an extensive European trip. Mr. Fulton particularly observed many improvements practiced by some of the foreign countries which would create more efficient production of pulp and paper if applied to the paper industry in this country.

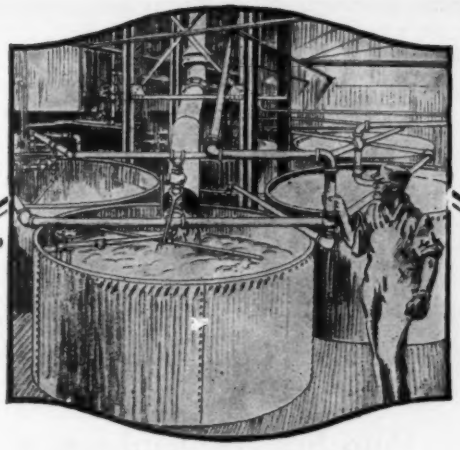
Gerrard, Ti-It Merger

The recent consolidation of the Gerrard Wire Tying Machines Co. and the Ti-It Machines Co., unites two of the largest and most prominent manufacturers and distributors of wire-tying machines and tie wire. The two organizations have earned an excellent reputation for splendid service, and with combined resources and experience, the new corporation expects and should be able to greatly extend its field of usefulness in the economical preparation of commodities for safe transportation.

The new corporation is known as The Gerrard Co., Inc., and will continue operation without any change in policy or personnel. Plants will be operated as formerly and provision made for expansion as its activities increase. The Gerrard Co. will have available wire-tying machines of capacity ranging from No. 8 to No. 22 gauge. This enables them to handle practically any class binding or bundling work from tying of a small parcel post package to the stowage of carload shipments.

Officers of the new corporation are, A. J. Gerrard, president; E. A. W. Murray, vice-president and western manager; and T. J. King, vice-president and eastern manager.

The Morse Chain Co. has appointed Mr. Harry E. Matthews as Manager of its Charlotte, N. C. office, to fill the vacancy caused by the death of Mr. George W. Pritchett. Mr. Matthews has been Assistant Manager of the Charlotte office for the past eight years and is well qualified to take over the responsibility of this office.



"A Good Valve Sits Tight —and Works When Wanted"

Said the superintendent. "In a paper mill, it's a fact that one valve that fails to close tight, or sticks when you want to open it, may mean the loss of a whole run, and cost us, in spoilage, ten times what a new valve's worth. Since we put in Darlings, we've had no trouble that way."

DARLING GATE VALVES close tight and stay tight. Yet they can be opened easily, without strain, by one man. Self-aligning discs, rotating to new seating positions each time the valve is operated, distribute the wear evenly, and add years to the life of the valve. There's a type of valve for every requirement of the paper industry—built to work smoothly, without attention or repairs, for years. This means a saving in maintenance cost that is well worth your serious consideration. Detailed information furnished on request.

DARLING VALVE & MFG. CO.

Williamsport, Pa.

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DARLING GATE VALVES

DUROFLEX
TRADE MARK
and
WICCAPEE
TRADE MARK
BELTINGS
For Jordans, Cone Drives, Beaters

Pulp Screen Diaphragms
Steam, Water, and Air Hose

Rubber Hose Nozzles to Order

NEW YORK RUBBER CORP.
Established 1851
BEACON, N. Y.
New York Office — 25 West 43rd Street

Belt Fasteners that are safe!

Crescent Belt Fasteners are built to join a belt so that it will stay joined for its longest life. They offer no sharp points to injure hands or clothing, no exposed points to wear from contact with pulley. Neither will they tear, crack or injure the belt.

Crescents offer satisfaction *plus* safety!

CRESCENT BELT FASTENER CO.
247 Park Avenue New York, N. Y.

CRESCENT BELT FASTENERS

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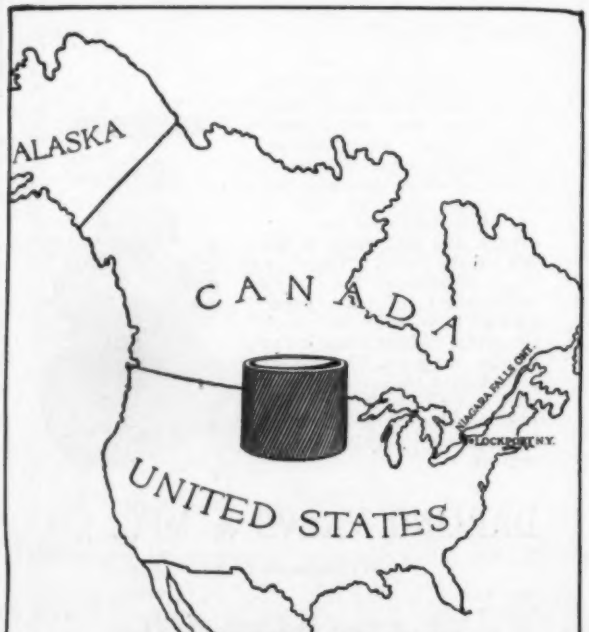

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ANIMAL SIZING GLUE STOCK
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E. F. RUSS COMPANY 287 Atlantic Avenue BOSTON, U. S. A.

CENTRIFUGAL PUMPS FOR THE PAPER INDUSTRY

The Bethlehem Horizontal Centrifugal Pump is of the double-suction, single-stage type with horizontal split casings. Capacities 200 to 17,000 gallons per minute against heads of 20 to 250 feet.

BETHLEHEM STEEL CO., *General Offices*, BETHLEHEM, PA.
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BETHLEHEM

WISCONSIN NEWS

Safety Record

A new record in safety, probably one that is world-wide, not only in paper mills but in industry generally, was made by the Niagara, Wis., paper mill of the Kimberly-Clark Co., Wednesday, October 26th, when that plant passed the 215-consecutive-day mark of operation without a lost-time accident.

One week earlier the Niagara mill passed the 209-day record of the Niagara Falls plant of this corporation. Niagara's best previous record was 172 consecutive safe days, and so its own record was also exceeded. With its 135,500 man-days of safety, it broke the 135,188 man-days record previously established by the Kimberly, Wis., mill of the company about two years ago, which was at that time hailed as the world record in safety.

Safety work in Niagara was started by M. G. Hoyman, now staff superintendent of service with headquarters at Neenah. Inter-department and inter-mill contests with suitable prizes have been a great incentive to safety endeavor. The $100,000 clubhouse built by the company for its employees provides an ideal place for safety forums and safety-teaching theatricals and movies. The Niagara mill employs 600 people.

In recognition of the safety efforts of the Niagara employees, the company will present two, free, Lyceum numbers to be given in the clubhouse Nov. 7 and 28.

Cause of Kimberly Disaster Unknown

While the Niagara people are jubilant over the enviable safety record established there, officials of the Kimberly-Clark Co. are still saddened by the disaster at the Kimberly mill last month which dealt a severe blow to its own safety records.

The very mill which hung up a record continuous safety run two years ago saw a collapse of its beater room No. 5 in which nine persons were killed and eighteen injured. Some of the victims were employees of the C. R. Meyer & Sons Construction Co., Oshkosh, engaged in construction work at the time, but most of them were paper mill workmen.

Rescue crews were organized and all operations in the mill suspended. It was nearly a week later before production was resumed. Meanwhile, carloads of material were left standing on the track with storage charges accruing.

The coroner considered an inquest unnecesary, but one was held at the company's request. The jury, however, was unable to determine the cause, and the deaths of the victims were attributed to an "unknown cause."

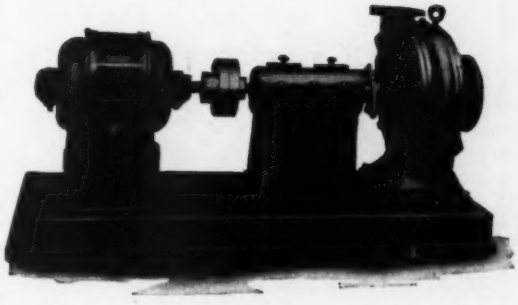
Many expressions of sympathy were received by the company from all over the country, and the Kimberly-Clark employees and relatives of those killed or injured tendered their thanks to the company for its splendid relief work during the disaster.

Power Plant Completed

Last month marked the completion of the $3,000,000 power project inaugurated by the Northern Paper Mills, of Green Bay, two years ago. A considerable portion of the hydro-electric power developed is utilized by the Milwaukee Electric Railway and Light Co., of Milwaukee, a subsidiary of the North American Co., and that company also uses a portion of the tower lines between Amberg and Green Bay.

The project began as an enterprise of the Northern Paper Mills to provide cheap power for the operation of the Green Bay mill, but later the Northern Electric Co., was organized by the paper mill officials to operate the power development independently of the paper company. Director's Day was observed on Oct. 19 to inspect the plants and lines and celebrate the completion. About 400 persons from all parts of the State were present.

The United States Supreme Court has denied the petition of the Fox River Paper Co., et al., for a re-hearing of its case to prove the unconstitutionality of the recapture clause



Warren Stuff Pumps Move Stock Faster

In many mills, Warren Stuff Pumps have considerably shortened the time required to fill the beaters.

Their speed and efficiency in transporting stock of 5% and greater consistency and their low cost of operation have made them the choice of engineers responsible for reducing production costs and boosting operating efficiency.

Let us tell you about some of the interesting performance records Warren Stuff Pumps have made and what they can do on your kind of stock. Write for Bulletins.

Warren

Steam Pump Company

Incorporated

Warren, Mass.

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Pulp Screen

WHAT DOES YOUR **POWER** COST YOU

UNHEARD OF LOW **POWER** PER TON

HALF **POWER** SAVED

VERY LARGE CAPACITY

VERY LIMITED FLOOR SPACE

OFFERED ONLY AFTER MANY MONTHS OF CAREFUL DEVELOPMENT

Improved Paper Machinery Company

Nashua, N. H., U.S.A.

of the Wisconsin water power act which prevented the company from starting the reconstruction of its dam without submitting first to the State's option to take over the property after thirty years. The company has now started rebuilding the dam, and expects to complete it within a few months.

A safety conference for the Wisconsin River Valley, similar to that organized in the Fox Valley two years ago, is in prospect. The movement was started at the recent National Safety Congress. Tentative plans for the organization were made at a recent meeting in Wausau. Franz H. Rosebush, of the Nekoosa-Edwards Paper Co., Port Edwards, is pushing the work, with the help of safety leaders from other paper mills in the valley.

A guy wire struck by a motor truck caused the collapse of a smokestack at the Central Paper Company, Menasha. The mill was shut down temporarily as a result.

The new paper machine of the De Pere Paper Manufacturing Co., of De Pere, will probably be in operation by the middle of November. It will have a capacity of 100,000 pounds daily. Chipboard and vat binding will be made on this machine. The present machine is producing 35,000 pounds of wrapping paper and tagboard daily.

The Nekoosa-Edwards Paper Co. is building a large addition to the finishing room of its plant in Port Edwards which will provide extra space for storage.

P. J. Lamoreaux, until recently superintendent of the Marinette and Menominee Paper Co., of Marinette, is leaving for the West to become affiliated with a paper company on the Pacific Coast.

Safety work begun in the Falls Manufacturing Co. paper mill at Oconto Falls, Wis., in 1920, has had a beneficial effect as can be seen in the reduction of the frequency rate of accidents. It has been brought down from 96.30 to 21.74, the latter figure being that for 1926.

A bond issue for $300,000 has been floated by the new Nicolet Paper Co. of De Pere. These are first mortgage bonds carrying interest at 5½ per cent. The company has common stock at $500,000 and preferred stock totaling $150,000. The assets of the company are listed as $1,110,-007.21. Two machines are in operation producing glassine and grease-proof paper.

Sale of the Peshtigo Paper Co., which is still in the hands of a receiver, was to have taken place last month, but in the absence of any bidders, it has again been postponed. The sale will take place on Nov. 28. If it is not sold, first mortgage bondholders will foreclose on Dec. 1. No bid lower than $1,600,000 will be accepted.

A special committee of the State Legislature is conducting a survey of all the undeveloped water power sites in Wisconsin as a part of the proposed plan of the State to take over sites and develop them. Under the recapture clause, the State also reserves the right to take over after thirty years any new water power that is developed.

The following cities are now giving, or making preparation to give, instruction in paper and pulp courses in their vocational schools under the direction of H. G. Noyes, state coordinator in charge of paper and pulp instruction in vocational schools: Appleton, Eau Claire, Kaukauna, Green Bay, Neenah, Menasha, Marinette, Wausau, Wisconsin Rapids, Rhinelander and Stevens Point.

Approximately 1,100 tons of ground wood pulp were lost when a steel barge being towed across Lake Superior for the Consolidated Water Power and Paper Company, of Wisconsin Rapids, broke in two and sank in the lake last month. Five

What's all this hullaballo about mechanical efficiency? It's possible for engineers to see superiority in design and to determine wearing ability by a check on materials used in a Speed Transformer. But the best test for everyone is a comparison of actual service.

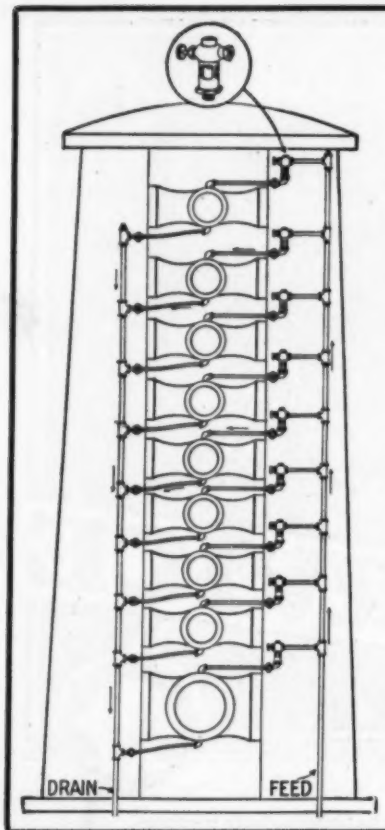
Study the Ganschow Speed Transformer Catalogue 111. Then ask for an installation near you so that you can see one at work. Or better still, let us show you an installation similar to the one you anticipate. You can make a complete survey of your own as to length of operation, maintenance, power required, space per horse power, etc. We feel positive that your figures on the service cost per unit of Ganschow Speed Transformers will be the lowest you can obtain.

Ganschow Type "B" Angle Drive Speed Transformer driving paper mill roll at world's largest rubber factory — Akron.

William Ganschow Company
1015 West Washington Blvd. Chicago
Plants CHICAGO and PEORIA
Representatives in Principal Cities

Original Designers and
Patentees of the Right-Angle Drive

GANSCHOW
SPEED TRANSFORMERS CUT GEARING



Individual feeds

for each calender bearing—

You can observe and control the amount of oil flowing to each calender bearing, when you utilize the Bowser system illustrated here. It is simple, but wholly effective. Oil consumption is kept at the minimum; bearing lubrication is kept always ample.

Bowser also provides systems that furnish "cascade" lubrication—where the oil flows by gravity from top to bottom bearing—with constant stream to each intermediate bearing.

Whatever your lubrication need, ask Bowser—or consult "Pulp and Paper Mill Lubrication"—an illustrated bulletin of universal interest. Ask Dept. 3.

S.F. BOWSER & COMPANY, Inc.
LUBRICATION ENGINEERS AND MANUFACTURERS
FORT WAYNE, INDIANA, U.S.A.
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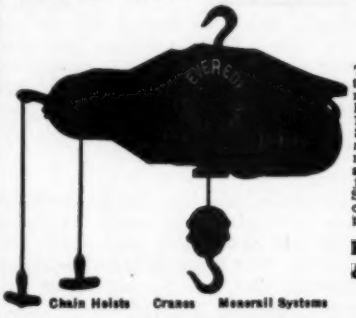
Pickles' Patent
Automatic Steam Regulator
FOR
Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

W. F. PICKLES Buckland, Conn.

500 lb. Electric Hoist
$225.00



This Everedy Hoist is the most accessible hoist made. Light—500 lb. hoist weighs 225 lbs.; 1000 lb. hoist 250 lbs. Speedy — 40 feet per minute A. C., 35 feet per minute D. C. Limit stop at top and bottom adjustable to any point. Suspended wherever chain or air hoist is placed.

Chain Hoists Cranes Monorail Systems

READING CHAIN & BLOCK CORP.
READING, PA.

PRESSURE PIPE THAT NEVER BURSTS
Built in sizes 1 inch to 48 inches

WYCKOFF WOOD PIPE

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained

WRITE TODAY FOR CATALOG AND PRICES

A. WYCKOFF & SON COMPANY
1855 Elmira, N. Y., U. S. A. 1927

THE JOHNSON FRICTION CLUTCH

The Clutch to use on your Paper Machines

Write for Catalog P. I.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

men were on board and they had a narrow escape. The loss did not affect the operation of the company's mills greatly.

A storage building, to be used principally for the storing of machine patterns, was completed by the Moloch Machine and Foundry Company, of Kaukauna, manufacturers of papermaking machinery.

The Menasha Printing and Carton Co. of Menasha has moved its sales and advertising departments to Chicago, and they are now located on the tenth floor of the Wrigley Bldg. The cost and purchasing departments remain in Menasha.

The flowage of the Fox River has been more favorable this year, for water power purposes, than in many years, according to T. W. Orbison, consulting engineer, of Appleton.

MICHIGAN NEWS

Michigan Superintendents Elect Officers

Michael Redmond, for 31 years general superintendent of the Kalamazoo Paper Co., has been elected president of the Michigan division of the American Pulp & Paper Mill Superintendents' Ass'n, to succeed George Pountain, presiding officer for the past three years.

George Pountain succeeds Alfred Bryant as secretary-treasurer of the organization. Mr. Pountain was the first secretary of the Michigan Division and served in that capacity for five years.

The vice-presidents named are: Clarence Thorne, Watervliet Paper Co., first; Clarence Harter, Watervliet Paper Co., second and Jacob Parent, Western Board and Paper Co., third.

Work is steadily progressing on the addition to the Kalamazoo Paper Co.'s turbine house, which, when completed, is intended to accommodate the power units that will drive the equipment in divisions two and four. This company's five divisions will then be electrically operated, thus lowering production costs.

Michigan Paper Co. Bonds for Sale

The $300,000 issue of 6 per cent bonds, which is to be offered by the Michigan Paper Co. of Plainwell and Kalamazoo, will be purchased by the First National Bank and Trust Co. of Kalamazoo, who will offer them for sale. The bonds will run 15 years, maturing serially with interest payable semi-annually.

It is understood these bonds are being sold to pay obligations incurred through the purchase of the assets of the Bradford Paper Co. and to finance certain improvements on the mills in Plainwell.

R. S. Hatch Joins United Filters

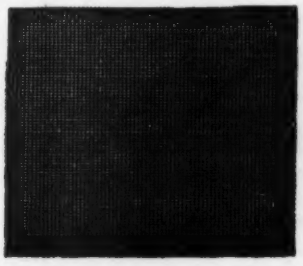
The increase of business in the pulp and paper field, has made it necessary that the United Filters Corp. add another paper technologist to its organization. They are fortunate in having secured the services of Mr. R. S. Hatch, who has had many years' experience in various branches of the paper industry.

Mr. Hatch is a highly trained engineer, and has had a wide experience in the management of paper mills. He has been a member of the Technical Ass'n of the Pulp & Paper Industry since its organization and served as president for two years. Mr. Hatch will make his headquarters at the New York office of the United Filters Corp.

Norman Spear Lawrence

Norman Spear Lawrence, vice-president and director of sales of Whiting Corporation, Harvey, Ill., passed away recently following a brief illness.

Mr. Lawrence was born May 9, 1882 at Chicago, Ill. Shortly after his graduation from Cornell University, he entered the



Superior weave

Smooth and of an even mesh, Superior wires do not groove the suction boxes. The strength inherent in their manufacture enables wires made by Cabble to give longer and better service at either high or low speeds.

Wires and facings for

Fourdriniers, Harpers and Yankees
Cylinder Machines and Wet Machines
Thickeners, Deckers and Save-alls

The William Cabble

Excelsior Wire Mfg. Co.

74-88 Ainslie St.
143-151-163 Union Ave. Brooklyn, N. Y.

If you are in the market for any used paper or pulp Mill machinery, write to us. We have at all times, good used paper machines, calender stacks, beaters, Jordans, Rotary and Flat Paper Cutters, Slitters & Rewinders, etc., etc. We also would be glad to have your list if you have any good used equipment for sale.

Address:-

Gibbs-Brower Co., Inc.

Paper and Pulp Mill Brokers
261 Broadway, New York City
Telephone—Barclay 8020
Our Motto: "SERVICE FIRST"

PAPER MILL MACHINERY

One 72" Pusey-Jones Fourdrinier Part. Takes wire 74" by 50 ft.
One 129" Hamblet duplex sheet cutter with layboy and six roll stand.
One 134" Pusey & Jones Uniform speed reel.
One 130" Moore & White four drum winder with slitter attachment.
Three Beloit triplex stuff pumps 10x20.
Two Pulp breakers, Noble & Wood, 1200 lbs.
Four beaters, Horne, 54" x 48" with wood tubs.

All above equipment in excellent condition, installed new in 1923.

51 Dryers 36" x 72" with frames, felt equipment.
One reel, two drum upright.
One 68" duplex sheet cutter, Downingtown.
One 72" Moore & White four drum winder.
Three Dayton beater rolls 66" x 60".
Two 72" Baker wet machines.
Two 3 pocket grinders with sones 54" x 27" direct connected to G. E. motor, 2200 volts, 60 cycles, 240 r.p.m.

For Sale By

FRANK H. DAVIS COMPANY

175 Richdale Avenue, Cambridge, Mass.

Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
Steel River Barges and Plate Work of all Kinds
Steel Transmission Towers

RITER-CONLEY COMPANY

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employ of Whiting Corporation and advanced rapidly. He was also president of the Swenson Evaporator Co., a subsidiary of Whiting Corporation. Mr. Lawrence was well known in the iron and steel manufacturing field and active in various business organizations.

Geo. W. Sisson, Jr., president of the Racquette River Paper Co., Potsdam, N. Y., a former president of the American Paper and Pulp Ass'n, recently visited the regular conference of the office staff of the association with representatives of paper industry periodicals.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of the Paper Industry, published monthly at 356 Monadnock Bldg., Chicago, Ill., for October 1, 1927.

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the state and county aforesaid, personally appeared Edw. B. Fritz, who, having been duly sworn according to law, deposes and says that he is the publisher of the Paper Industry and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Edw. B. Fritz, 356 Monadnock Bldg., Chicago, Ill.; Editor, A. Scott Dowd, 356 Monadnock Bldg., Chicago, Ill.; Managing Editor, A. Scott Dowd, 356 Monadnock Bldg., Chicago, Ill.; Business Manager, Edw. B. Fritz, 356 Monadnock Bldg., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Edw. B. Fritz, 356 Monadnock Bldg., Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only.)

EDWARD B. FRITZ
(Signature of editor, publisher, business manager, or owner.)

Sworn to and subscribed before me this 7th day of October, 1927

(Seal) S. J. LEHRER, Notary Public.
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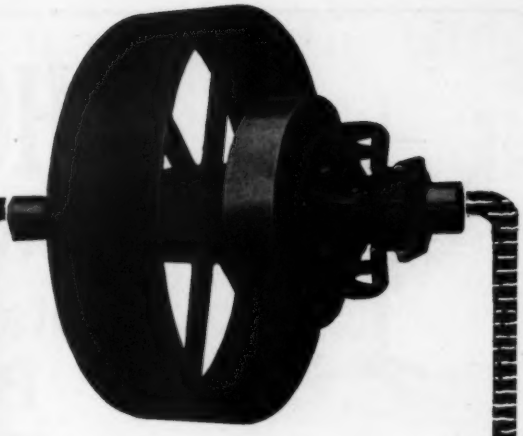

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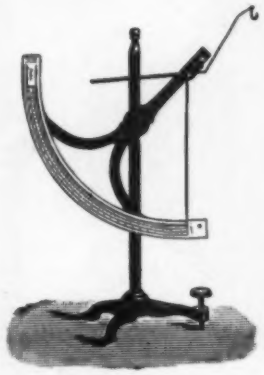

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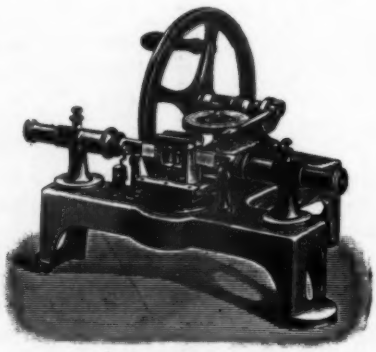

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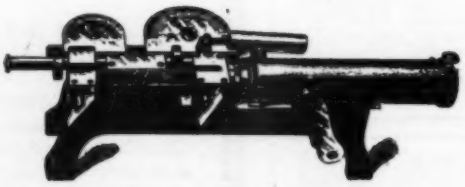

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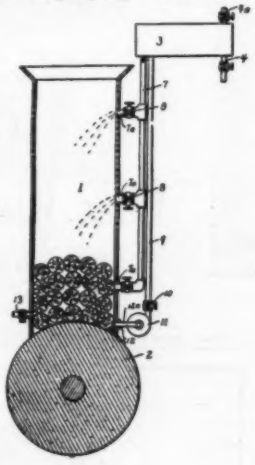
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Grinding Wood Pulp

UNITED STATES Patent No. 1,633,733 is concerned with a process for manufacturing ground wood pulp in an apparatus which is shown in the accompanying illustration. The grinder is shown provided with a magazine (1) and a liquor supply (3) which is located over the magazine and which is used for distributing a stream of liquor in the upper part of the magazine. At the bottom of the magazine, close to the grindstone itself, there is located an outlet (12) which communicates by means of the pipe (12a) with the small centrifugal pump (11), which serves to raise the liquor back again into the tank (3). In this way a constant circulation of the liquor is secured. The flow by gravity from the tank (3) takes place through the pipe (7), and branch lines are connected at various points to this pipe and open out into the magazine of grinder, as at (7a).



Removing the Water in Paper Pulp

FRENCH Patent No. 623,989 is concerned with a method and apparatus for extracting water from paper pulp and the like. In the ordinary paper machine, the paper web passes from the wet end of the machine over a number of cylinders which complete the drying process that is started by the suction boxes. The heat of the steam is not conducted directly to the paper, but through the steel walls of the cylinders. The inefficiency of this mode of heating is particularly evident when the steam contains oil. The oil has an insulating effect on the inside of the cylinders. The purpose of the present invention is to avoid these disadvantages and difficulties.

Superheated steam is employed and applied directly to the surface in such a manner that the moisture is removed from the paper. Superheated steam above a certain temperature and used at a definite speed is able to remove a relatively large amount of water. The steam may be reduced to a low or moderate pressure and is preferably directed against the surface of the paper in the form of jets. The angle at which the jet of steam is directed against the surface of the paper must be such that the mechanical action of the steam on the water present in the paper is most advantageous. This angle should be preferably less than a right angle. The water drawn out of the paper and the steam that is condensed are recovered in tanks and fed to the boilers.

In figure 1 the tubes (A) are arranged for the passage of the superheated steam. These tubes are mounted above a web of paper (B) which moves along, and a hood (C) which receives the steam and the evaporated water. The mixture is led away from the hood (C) by the opening (c) at its upper part. The tubes (A) are provided with a number of perforations (a') arranged in the direction of the length of the pipe, as may be seen from figure 1a. These perforations are of such number and in such arrangement that jets of steam strike the paper web across its full width and at the proper angle to effect the greatest removal of the moisture.

Fig. 1.

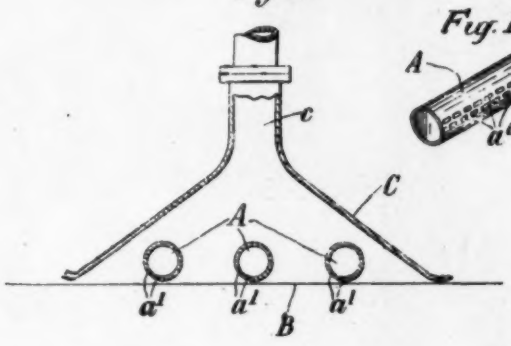
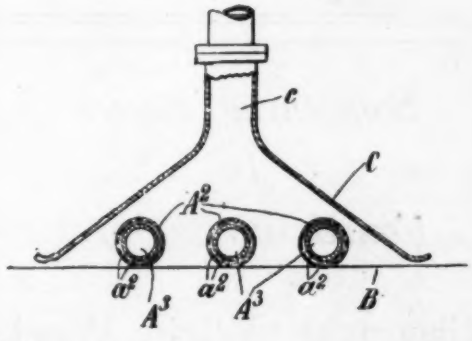


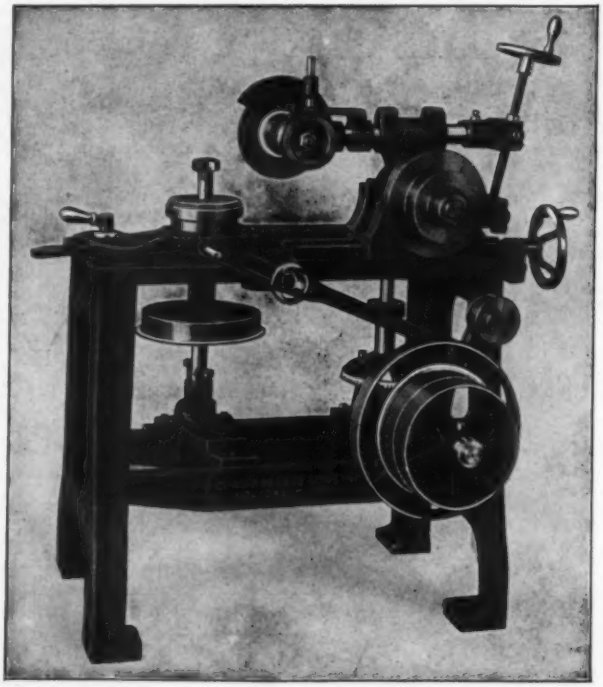
Fig. 2.



It is also possible to use perforated rollers, as shown at (A^2) in figure 2. Here again a number of longitudinal openings are arranged in the adjustable jackets surrounding the rollers so that the jets of steam will hit the paper web in the optimum manner. The temperature within the tubes may be automatically regulated.

Improved Method of Determining Bleached and Unbleached Pulp

THE sample is treated with a two per cent solution of Malachite Green, which has been acidified with the aid of acetic acid. The sample is then heated over a suitable flame until it is almost dry. Then it is well washed, and a solution of fuchsin after cooling is allowed to drop on the glass plates on which the samples are placed. After a minute has elapsed, the samples are treated with a solution of hydrochloric acid which is prepared as follows: one cubic centimeter of concentrated hydrochloric acid is diluted up to a volume of one liter, and the solution is then ready for use. After the samples have been washed, they are ready to be examined further. It is found that completely bleached pulp



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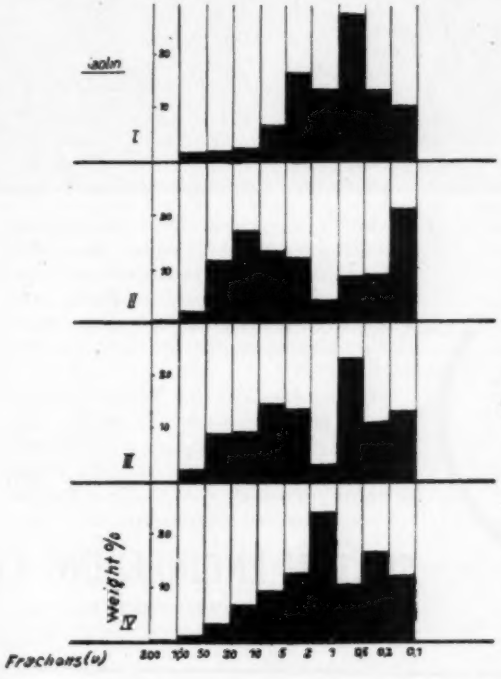
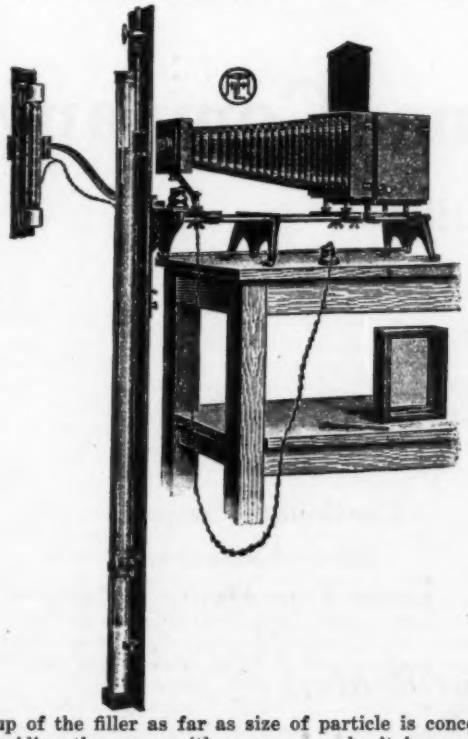
does not color at all; bleached stock colors a slight rose red; unbleached stock a red and mechanical wood pulp a bluish green. Bum. Prom., volume VI, year 1927, pages 366ff.

Measuring the Size of Paper Filler Particles

A NEW apparatus has been devised for measuring the size of paper filler particles in order to determine their suitability for this purpose. The apparatus automatically regis-



ters the result of the mensuration in the form of a sedimentation curve, which immediately gives a clear picture of the



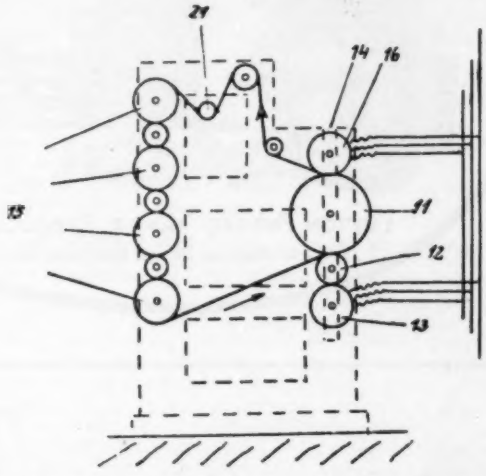
make-up of the filler as far as size of particle is concerned. By providing the curve with a proper scale, it is very easy to read off the absolute sizes of particles in magnitude, and also in proportion of the total mixture.

The article goes into considerable detail on the mathematics of the method and discusses the principles on which the apparatus is built and manipulated. The instrument actually measures the specific weight of the suspended particles of the filler. It is possible to use the apparatus as a flocculation meter. For further details the reader is referred to the original article in Der Papierfabrikant, 1927, pages 525 to 530.

Winding Paper on Rolls

GERMAN Patent No. 444,348, which covers the apparatus shown in the accompanying illustration, is concerned with a process of winding paper off one roll on to another, in which operation regular movement of the paper web is secured by arranging the rolls in such fashion that they come into contact with one another.

The figure shows a calender and the roll that is being unwound is shown at (11), while the paper is being wound up on the roll (12). This latter roll is driven by the friction roller (13) which is located beneath it. The winding rolls



(11) and (12) are arranged in movable bearing located in the housing of the calender. These slots or bearings are shown at (14). The paper web runs from the roll (11) over the calender rolls (15) to the roll (12). The calender rolls are driven at a speed which is not in excess of that of the friction roller (13).

Another driving roller may be located above the roller (11), as seen at (16) also for driving the unwinding roller (11) and the speed of this roller, that is (16), is the same as that of the roller (13), the two being coupled to the same prime mover. The tension on the paper is regulated by means of the tension roller or idler (21).

Measuring Wetness Factor of Mechanical Wood Pulp

THE Schopper-Riegler apparatus is used to measure the wetness factor in mechanical wood pulp. This apparatus has attained very considerable importance for the control of the grinding operation, since in the case of ordinary "newsprint" manufacture under rigorously standardized conditions, all the technically important qualities of the paper can be governed by the factor established by this test. An investigation of the sources and limits of error in the Schopper-Riegler test has led to the recommendation that the standard test should be carried out on one thousand cubic centimeters of a suspension which contains 0.30 per cent of the absolutely dry fiber at the standard temperature of 20 degrees C.

The error which is due to variations in the temperature, is a fall of 0.462 "wetness" or "slowness" unit per degree rise in temperature. Variations in the volume of the suspension with constant concentration induce a rise in the "slowness"

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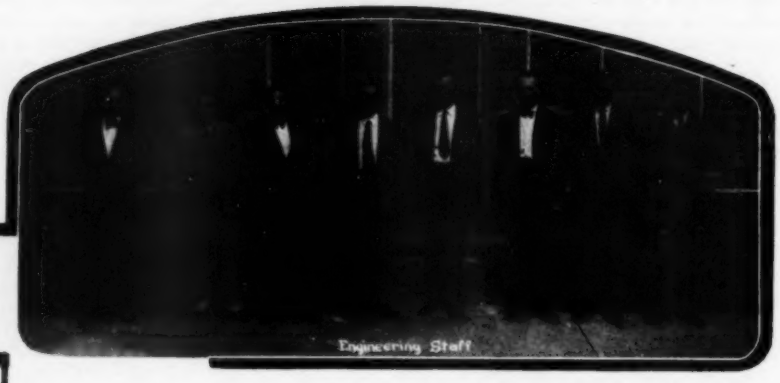

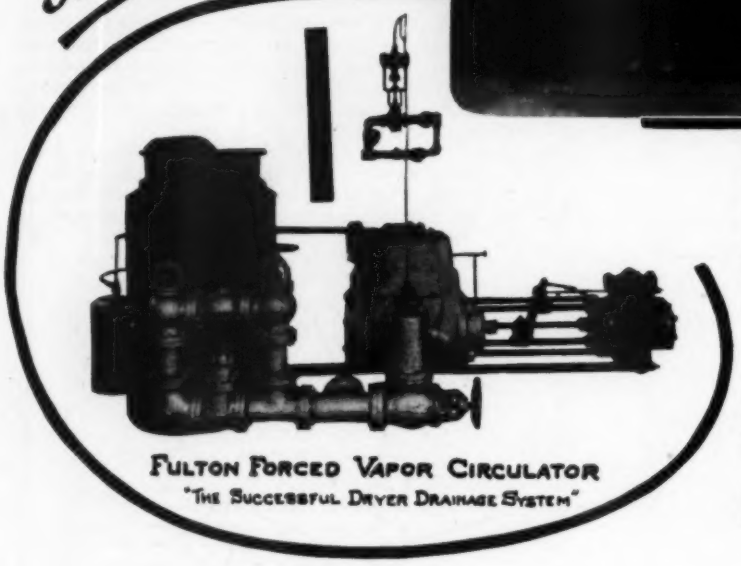

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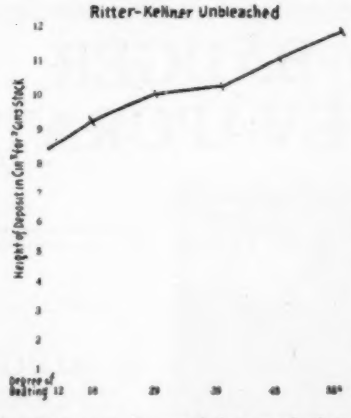
factor with fall in volume but not in direct proportion. The principal source of error is a variation in consistency, that is, dry fiber substance present in the thousand cubic centimeters of suspension. This error is large if concentrations below 0.3 per cent are selected for the test. On the other hand, if higher concentrations are adopted, the error is reduced, but the sensitiveness of the test is much impaired.

Errors in concentration may be minimized by adopting standard manipulation in preparing the suspension. It is recommended that 250 cubic centimeters of the sample of fluid pulp be collected on a filter in a Buchner funnel and pressed to a cake of standard dry substance by means of a brass plate and weight calculated to give a uniform pressure of 0.445 kilograms per square centimeter for three minutes. The calculated quantity in this case necessary to give three grams of dry fiber is shaken with the complementary volume of water for the test suspension. Lastly, a slight modification of the test apparatus for eliminating the personal factor in releasing the flow for the test is recommended, or alternatively the adoption of the improved pattern of instrument devised by the Canadian manufacturers. Der Papier Fabrikant, Fest and Ausland Heft, 1927, 45-60.

Wood and Pulp Slime

A VERY interesting address was recently read by Dr. Schwalbe before the 1927 annual meeting of the Association of Pulp and Paper chemists and Technologists in Germany and published in Der Papierfabrikant, 1927, pages 481-5. This paper was concerned with the problem of the formation of slime. In the first place, a discussion was given of the slime-forming ingredients in wood and pulp fibers and also of the most important physical and chemical properties of the slime that is produced from them. Thus the solubility of slime in a sixteen per cent solution of sodium hydroxide, the reprecipitation of the slime, and the depth of the deposit that is formed on centrifuging are described and recommended for use as an indication of the degree of beating of the paper stock. These may be used as control factors.

It is pointed out that the most important property of the slime for the paper manufacturer is its capacity for sweating when placed in a humid atmosphere. This refers simply to its absorption of moisture under these conditions. The sweating action can be enhanced by strong pressing and also by careful drying. This avoids the subsequent loosening-up of the felted paper fibers. Thus simultaneous drying, carried out on both sides of the paper web, by means of radiating heat can be used for producing a product of greater strength and of other more favorable properties, by the aid of the sweating action. In addition to the sweating capacity of the slime, the curling of the fibers appears to be of particular importance in determining the strength of the paper that is made from these fibers. The curling effect of the fibers may perhaps be determined from the volume of sedimentation.

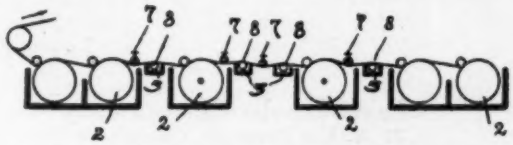


The relation between the depth of the deposit in cubic centimeters for two grams of Ritter-Kellner unbleached stock, and the degree of beating can be seen from the figure.

The importance of the character of the surface, that is, the degree of roughness, is also considered. Recent Finnish reports indicate that pulps with smooth surfaces are superior to those with rough surfaces as far as strength is concerned. The rough fibers are produced by too strong digestion which naturally has a very bad effect on the strength of the fibers. The strength of the individual fibers has, of course, some effect on the strength of the paper sheet which is prepared from them, but it is apparently not the most important factor in determining the strength of the paper. The skilled paper maker can very well manufacture a good, strong paper from rather poor raw materials. He obtains this result by taking advantage of the binding effect of slime as well as on the curling of the fibers that is produced during the beating process. These two factors are by far the most important influences in producing a paper of requisite strength.

Waterproofed Paper

GERMAN patent No. 447,505 is concerned with a process for making water-proof paper, in which the paper stock is combined with a water-proof emulsion during the process of its manufacture. The combination of the stock with the



emulsion is carried out at certain points in the papermaking machine in which the paper web is formed in the normal manner. The layer of water-proof emulsion is applied to the under side of the paper web. For this purpose an arrangement is used as shown in the accompanying illustration.

This device is placed between cylinders (2) and the box (3) of a paper-making machine. The rollers (8) are provided for applying the coating of water-proof emulsion to the underside of the paper web. Adjustable pressure rollers (7) are arranged in the vicinity of this arrangement and these rollers are used to regulate the tension that is being applied to the paper fibers in the paper web.

Newest Results with Pulp Drying Machines

THE increase in the capacity of drying machines has been increased by building in a rotating suction box, intermediate dryers, high pressure presses and particularly by entirely omitting the felt presses and substituting for them a felt-less, deeply grooved press, as well as by inserting a smooth press, which is either detached or which works against a drying cylinder. A modern drying machine with a capacity of 75 tons of ninety per cent sulphate pulp per day is composed of the following parts: wire with three rotating suction boxes (each one connected with a vacuum pump), the regular couch press, one deeply grooved high pressure press with combined pressing and suction effects, two intermediate dryers of 900 millimeters diameter, one standard high pressure press, one detached smooth press and 46 drying cylinders of 1250 millimeters each in diameter. The rapidity of the stock travel amounts to eighteen meters per second; the weight of a sheet of pulp is 1000 grams per square meter; the absolute dry content of the sheet after passing through the first press is 38 to 41 per cent; the absolute dry content of the sheet after the second press is equal to 54 to 56 per cent. The large extent of the drying surface is due to the use of low pressure steam in this case, this low pressure steam being obtained from the waste liquor concentrators. This steam carries along with it a certain amount of incrustating substances which exert an insulating action.

The capacity of a drying machine depends largely on the quality of the stock. Nevertheless, it is possible to figure that the press which does not contain felts can process 25 tons of ninety per cent stock per meter, while only 22 tons are similarly processed in a machine which contains both felt presses and high pressure presses. Svensk Papp. Tion., volume 3, pages 75 ff, year 1927.

The Thorne Bleaching Process

VARIOUS details of this process are discussed. The saving in chlorine effected in the process is claimed to be due to the use of higher concentrations of stock in the towers (eighteen to twenty-two per cent), to the separation of the bleaching process into two stages and the rational distribution of the bleaching effect through these stages, and finally to the washing of the preliminarily bleached stock between the stages.

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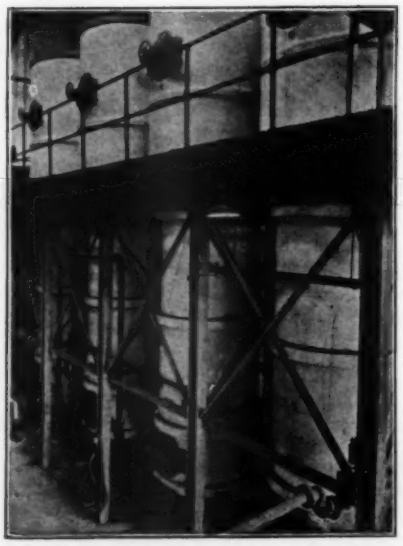


NON-FOAMING

MAXIMUM
STEAM ECONOMY

NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1926 Paper and Pulp Mill Catalogue

the saving in bleaching agent rises as the total chlorine consumption in the first stage is delayed. It is indicated that just so much bleach liquor should be added to the first stage as the stock can actually consume in this stage of the bleaching. The fact that the stock is washed after the first stage gives a certain clue to the reason why the chlorine consumption is low.

The saving in steam or heat, just like the saving in chlorine, is dependent upon the conditions that exist in the plant, hence, varies considerably. The saving in heat can be calculated and a series of calculations are given to show the comparison of the consumption of heat by the new method in relation to the older bleaching beater method. The following results were obtained:

1—Bleaching in towers:

Production of 100 tons of stock.

In the evaporators	12 horsepower
In the screw presses	48 horsepower
In the mixers	50 horsepower
In the towers	6 horsepower
In the compressed air nozzles	20 horsepower
Total	136 horsepower

which is at rate of 1.36 horsepower per ton of stock.

2—Bleaching in towers (first stage high stock density) and in Bellmer beater (second stage low stock density).

Production 250 tons of stock.

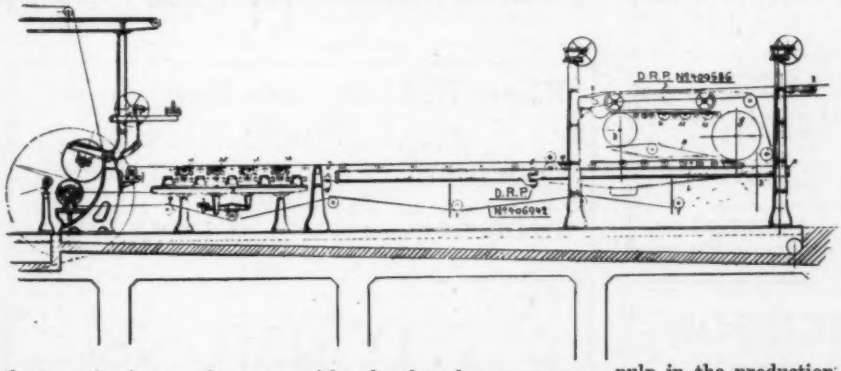
In the evaporators	15 horsepower
In the screw presses	72 horsepower
In the mixers	70 horsepower
In the towers	14 horsepower
In the compressed air nozzles	50 horsepower
In the evaporator	15 horsepower
In the Bellmer beaters	175 horsepower
Total	411 horsepower

which is at the rate of 1.64 horsepower per ton of stock.

For further details, the reader is referred to the original article in Der Papierfabrikant, year 1927, pages 557-560.

Special Papermaking Machine

THE feature of the machine, shown in the accompanying illustration and patented in German Patent No. 409,586, is the top wire in the wire part of the machine and also the divided registering rails provided for parallel shaking, which is patented in German Patent No. 406,942. The purpose of

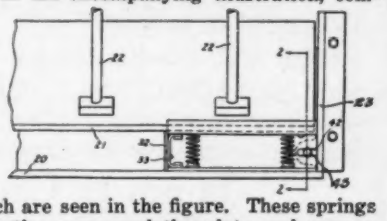


the top wire is to make paper with a hand-made appearance with water-marks, and paper whose stock has been so freely ground and is so strong it is not possible to obtain a better shaded water-mark by hand sampling. Furthermore, the top wire gives a properly water-marked paper which is regular in properties, such as tearing length, stretch, folding number, and the like, both in the transverse direction as well as in the direction in which the paper was made.

The paper stock, which is to be worked up into paper, enters through the channel (R), in a direction opposite to the direction of travel of the wire (L), and comes upon the top wire (O). The entire top wire (O), which is short in comparison with the lower wire (L), runs over the breast roll (B) and the couch roll (G), which is large and may be considered as a cylinder wire screen, and the suction boxes (S1), (S2) and (S3). This, with the rest of the parts in that portion of the machine, forms a small wire portion which is completely closed off by itself. In order to prevent crushing the paper at the point where the paper web moves from the top screen (O) to the screen (L), the wire (L) is given a parallel shaking motion. The operation of this part of the papermaking machine is a direct attempt to simulate the operations that are carried out in the papermaking process by hand.

Inlet in Papermaking Machine

THE inlet arrangement in the papermaking machine, which is patented in United States Patent No. 1,643,657 and which is shown in the accompanying illustration, comprises a flow directing apron and a plate which effectively controls the height of the inlet opening. The width of this opening is varied by means of spring devices, which are seen in the figure. These springs are arranged between the apron and the plate and are arranged so that they close off a portion of the inlet opening.



Pulp from Various Raw Materials

IN THE production of a cellulose and paper from the straw of rye, wheat, barley, oats, reeds, Indian corn straw, rice straw, esparto, sugar cane, sunflower stalks, cotton plants, papyrus and similar raw materials, the material is boiled at a temperature above 100 degrees C., but not exceeding 140 degrees C., with caustic soda lye, with or without the addition of sodium sulphide. At this temperature, glutinous substances are not destroyed. After boiling, the mass is cooled down to about 30 to 35 degrees C. and the separation of waste liquor is carried out at that temperature. The washing is carried out at a temperature not above 30 degrees C., preferably in a rotary filter, petroleum or other oil of high boiling point being added to prevent the formation of scum.

Pulp parchment paper or grease-proof paper is obtained from the pulp so produced by grinding to a temperature of 65 to 80 degrees Schopper-Riegler. Thicker papers may be obtained by heating the pulp to a temperature of 40 degrees C. before feeding on to the wire cloth of a paper machine. Kraft paper equal to that of the best sulphate pulp is obtained by grinding to 55 to 60 degrees S. R. and the strength of this paper may be increased by the addition of ten per cent of ordinary kraft pulp, strong sulphite pulp, or jute, hemp, or cotton fibers.

The cellulose obtained may be mixed with three parts of mechanical pulp in the production of newsprint paper, the yellow color being covered by adding suitable dyes. The pulp may be bleached with ordinary bleaching liquids such as chloride of lime, preferably at a temperature of 25 degres C, and the produce may be used wholly or partly in place of bleached sulphite pulp in the production of fine papers of all grades. In an example, 150 to 170 kilograms of caustic soda are used for boiling one thousand kilograms of chopped rye straw. The bleaching which is effected at a temperature not exceeding 30 degrees C, may take place during the grinding which is done in beaters with broad knives. Brit. Pat. No. 269,154.

Reducing Tendency to Slime Formation

BLEACHED and beaten pulp is treated at a temperature of 10 to 20 degrees C for the purpose of reducing its tendency to form slime. The paper stock treated in this manner must, however, not be thought to be altogether safe from slime formation. It is, however, true that the pulp loses its hydrating or swelling power and also its absorptive power. Bum. Prom. volume VI, year 1927, pages 3336ff.

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ELECTRIFICATION PAPER MILL PROPERTIES

435 NORTH MICHIGAN AVE.
TRIBUNE TOWER
CHICAGO

New York, November 1, 1927.

THERE is activity of fairly broad dimensions in the paper market at present. There is considerable room for improvement in some directions and it is apparent that buyers are exerting caution in their operations, yet current business is very steady in its development, and in the aggregate is of good volume. Manufacturers, mill agents and jobbers mostly report that the movement of paper into consuming channels is of at least normal tonnage, if not running a little in excess of normal, for this period of the year, and sufficient business is arising to keep a majority of paper and board mills well engaged at fairly near to full capacity.

The market situation is healthy decidedly. Consumers are buying almost exclusively to satisfy actual needs, and jobbers are ordering from mills only in volume sufficient to cover their commitments to consuming customers. From all signs no stocking up at all is being done; publishers, printers, converters and other users of paper are following a most reserved policy in filling their paper requirements, and it is evident very little or no accumulation of supplies is occurring in any quarter. Paper manufacturers also are following a conservative policy in the production of their product. In most branches of the industry the output is being kept somewhere in relationship to the scope of demand; mills are endeavoring to prevent stocks from piling up and are watching intently the development of business and their own inventories and doing all they can to keep the two about on a par.

That the industry has experienced pronounced market improvement is shown by the latest statistics regarding production, shipments from mills, etc., which go to prove that manufacturing activity has increased appreciably since the midsummer lull which invariably affects the paper market. The monthly report of the American Paper and Pulp Association for August shows that paper production gained 12 per cent in that month as compared with the preceding month, amounting to a total of 591,593 net tons of paper and board of all kinds, against 513,459 tons in July. The August output also compared with 560,342 tons produced in June, 543,592 tons in May, 558,412 tons in April, 596,448 tons in March, 525,896 tons in February, aand 515,603 tons in January. The August production was larger than in any month this year up to that month with the single exception of March. Mill stocks at the end of August totaled 269,337 tons, recording a little increase over the 259,429 tons a month previously of all grades. Shipments from mills during August aggregated 582,435 tons, against 518,824 tons in July.

Production of newsprint in the United States in September amounted to 114,735 tons, and shipments from mills were 114,325 tons, while production in Canada was 178,815 tons and shipments 177,195 tons, making a combined total of 293,550 tons produced and 291,520 tons shipped, according to the News Print Service Bureau. During September 16,909 tons of newsprint were produced in Newfoundland and 1,109 tons in Mexico, so that the total North American output for the month amounted to 311,568 tons. The Canadian mills produced a total of 1,519,235 tons in the first nine months of 1926, or 138,513 tons more than the 1,115,232 tons made in the same time last year, which was a gain of 10 per cent. The United States mills produced 1,136,036 tons in the first nine months of the current year, against 1,259,506 tons in the corresponding time a year ago, or a loss of 10 per cent, while the production in Newfoundland was 16,795 tons more than in the first nine months of 1926, an increase of 13 per cent, and in Mexico 1,206 tons or 13 per cent greater, making a total North American increase of 33,044 tons or one per cent. During September the United States mills operated at 80.1 per cent and the Canadian mills at 84.1 per cent. Stocks of newsprint at the end of September amounted to 30,751 tons at U. S. mills and 33,384 tons at Canadian mills, making a combined total of 64,135 tons which was equivalent to 4.5 days' average production, and comparing with 62,078 tons at the end of August last.

The output of paper board in the United States scored a sharp gain in August, when more board was manufactured than in any previous month this year, according to the monthly statistical summary of the board industry compiled and issued by the Department of Commerce in Washington. A total of 232,723 net tons of board was produced in August, against 189,875 tons in July, making a total of 1,622,819 tons made in the first eight months of this year, contrasted with 1,689,757 tons in the same period of 1926. Board mills produced at 89.7 per cent of their rated capacity in August, against 79.1 per cent in the preceding month; received new orders calling for a total of 227,397 tons of board, compared with 212,434 tons in July, and had unfilled orders on file for 112,763 tons at the end of August, against 115,097 tons at the end of the preceding month. Shipments of board from mills in August aggregated 229,719 tons, contrasted with 194,131 tons in July, and stocks at mills at the end of August amounted to 52,283 tons, against 49,519 tons a month previously.

August employment in the paper and pulp industry increased over July, according to figures made public by the Bureau of Labor Statistics, Department of Labor, in Washington, which show that reports from 221 paper and pulp mills gave their July employment at 56,777, increasing in August to 57,423, an increase of 1.1 per cent.

The demand for newsprint rules steady, and it is evident that consumption in the last few weeks has mounted substantially. With publishers receiving a larger amount of display advertising, they have been obliged to add pages to their issues, while circulation also has increased. The contracting season for newsprint is here and it is stated that publishers are generally exceeding their allotments for next year over this year. Nothing but talk is heard in the trade anent the possibility of a reduction in the contract price basis and it seems improbable that any change will be made.

Kraft paper is moving steadily and in good volume. Demand in recent weeks has been of ample tonnage to keep mills fully engaged, in fact, and prices exhibit firmness. Tissue paper demand has increased also, and it can be said that the tendency in quotations is upward although no actual changes of note have been reported. Fine paper is in routine call and steady quotably. Mills are operating on curtailed schedules but have found it necessary to expand their production somewhat recently. Book paper is moving freely and at maintained prices. Specialties of most kinds are in good demand, notably glassines, parchments and fancy designed cover papers for paper box purposes.

It would appear as if demand for box board is commencing to slacken following a very active period for manufacturers. This is more or less a seasonal condition, however, and was therefore anticipated. Most board mills still have fair commitments on their books which will keep them busy for a while longer, and quotations are steady at $52.50 a ton delivered in New York City for filled news board and $50 for plain chip.

Building felt and papers are in moderate demand, considering the time of the year, and prices are steady.

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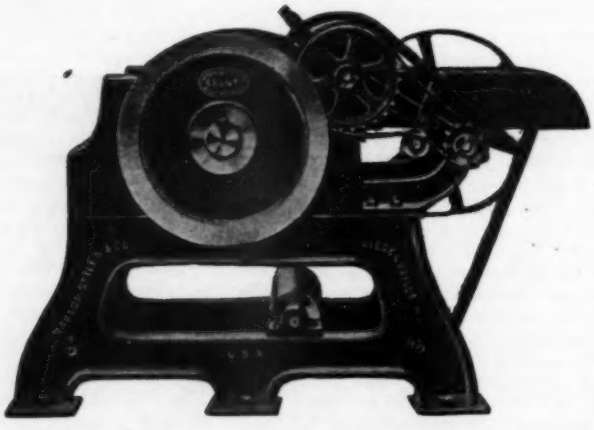

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Domestic Raw Materials

Papermaking Rags

A strengthening trend is noted in the lowest class of papermaking rags or roofing stock and is easily the feature of the market. Felt paper mills have been rather anxious buyers of domestic roofing rags and have run prices up at least a few dollars per ton during the last several weeks, and the situation is such that it appears probable a further increase in market values will take place. Dealers declare they are well sold up, that incoming supplies from collection sources are not up to normal, and that demand is developing in a manner indicating mills are in need of stock. Moreover, importations of roofing rags have dropped off to a degree, due to consumers here concentrating their purchases on domestic stock and also to the relatively higher markets prevailing in European countries, that this phase of the situation may have considerable influence on market prices.

Felt manufacturers in the Middle West have paid $37 per ton or 1.85 cents per pound f. o. b. shipping points for No. 1 domestic roofing, and it is possible a shade above this price has figured in some transactions. In the East, 1.80 cents at dealers' points has been paid for No. 1 domestic roofing or cloth strippings, and 1.45 cents for No. 2 stock. Foreign dark cottons have sold at 1.65 cents ex dock New York, representing a slight rise, and it is reported that most importers are reluctant to accept further orders on this price basis, owing to difficulty experienced in buying abroad at low enough costs to net them a profit in turning the rags over to consuming mills here.

From all indications, roofing rags are in a firm market position in Europe. Germany is consuming on a fairly large scale, and so are some of the other countries on the other side of the Atlantic. Dealers are said to be able to secure higher prices at home than in shipping to America and consequently fewer offers are being made here. Also, American importers are obliged to work on so narrow a margin of profit that they have been hesitant to buy for shipment from abroad unless having the rags sold to mills. Latest figures show that imports into the United States this year have been far under those in the corresponding period of last year, and the decline in importations in the last several months has been especially marked.

New cuttings of most grades are in fair demand and are holding steady in price. Due to curtailed operations in the clothing manufacturing field, production of cotton cuttings has been limited, and the market seems to be well sold up, particularly on certain kinds of cuttings. Dealers ask 12 cents or higher per pound f. o. b. shipping points for No. 1 white shirt cuttings, 6 cents for fancy shirt cuttings, 7 cents for blue overall cuttings, 10 cents for unbleached cuttings, 9 cents for bleached canton flannels, 7.50 cents for light silesias, and 5 cents for black silesias. Cottonades have moved in good volume and are quoted at 3.50 to 3.75 cents a pound at shipping points, while khaki cuttings display price firmness at 6 cents per pound.

In old rags, there is a moderate demand for whites but business is developing spottily. Writing paper manufacturers apparently are using such rags in much less than normal tonnage and are placing orders only as their requirements arise. New York City packing of No. 1 repacked old whites is quoted at about 6 cents a pound f. o. b. that city, and No. 2 repacked whites at around 3 cents. Repacked thirds and blues are selling at 2.25 cents and slightly higher at shipping points, and rough blues at 1.75 cents a pound.

Little trade activity of consequence is reported in the better qualities of foreign rags. Occasional sales of whites and blue cottons are recorded, and linens are in some demand but prices display no important change.

Average quotations f. o. b. shipping points and ex dock New York are as follows:

	New York and Chicago
New Stock—	
White shirt cuttings, No. 1	12.00-12.25
White shirt cuttings, No. 2	7.00- 8.00
Fancy shirt cuttings	6.00- 6.25
Washables, No. 1	4.50- 4.75
Unbleached muslin	9.75-10.00
White lawns	9.00- 9.25
Overall cuttings, blue	6.75- 7.00
Black silesias	4.75- 5.00
Light flannelettes	8.50- 8.75
Canton flannels, bleached	8.75- 9.00
Canton flannels, unbleached	8.00- 8.25
Shoe cuttings, bleached	8.50- 8.75
Shoe cuttinga, unbleached	6.75- 7.00
Light silesias	7.25- 7.50
O. D. khaki cuttings	5.75- 6.00
Mixed khaki cuttings	5.25- 5.50
Corduroy cuttings	3.00- 3.25
Cottonade cuttings	3.50- 3.75
Linens, No. 1 white, foreign	13.00-14.00
Light prints, foreign	2.75- 3.00
Old Stock—	
Whites, No. 1 repacked	6.00- 6.50
Whites, No. 2 repacked	2.75- 3.25
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.75- 6.00
Thirds and blues, rough	1.60- 1.75
Thirds and blues, repacked	2.10- 2.35
Black Stockings	3.75- 4.00
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	3.00- 3.25
Roofing, No. 1 (cloth strippings)	1.75- 1.85
Roofing No. 2	1.40- 1.50
Linsey, garments, foreign	1.80- 1.90
Dark colored cottons, foreign	1.60- 1.70
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.25
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.80- 2.00

Rope and Bagging

Paper manufacturers are absorbing supplies of old rope in a fairly consistent manner, but it appears as if demand is concentrated on domestic rope, with the result the price tone in the domestic product is firmer than in foreign old rope. Dealers assert that they are not receiving anything like normal amounts of domestic old rope, particularly high-quality stock, and they are somewhat cautious in booking mill orders. Generally, 4 cents per pound at shipping points is demanded for No. 1 domestic old manila rope, while sales of foreign old manila have been recorded at 3.50 cents a pound ex dock at New York. Mixed strings are wanted in a steady manner and prices rule at approximately previous levels or around 1.15 cents a pound at dealers' shipping points.

Scrap bagging is in routine demand from paper mills regularly consuming this material. Prices are about stationary at 1.65 cents to slightly higher per pound at shipping points for No. 1 scrap burlap, and 1.25 cents for roofing bagging. Not much bagging is coming into the country from abroad, due, it is said, to higher market prices obtaining in Europe.

F. o. b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.85-2.00
Gunny, No. 1 foreign	1.80-2.00
Scrap bagging, No. 1	1.60-1.75

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STANDARD BLEACHING POWDER

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The Leshner Paper Stock Co.

INCORPORATED

Hamilton, Ohio

Branch—Cleveland, Ohio

Roofing bagging	1.20-1.30
Wool tares, heavy	2.25-2.50
Wool tares, light	2.00-2.25
Manila rope, No. 1 foreign	3.50-3.75
Manila rope, No. 1 domestic	4.00-4.25
Sisal strings	1.75-2.00
Mixed strings	1.00-1.25

Old Paper

There are signs that demand for old paper is slowing down, yet the market is sufficiently active to sustain values and very little definite change has occurred in quoted rates. Consuming mills are endeavoring to buy cheaper while contending they are using less tonnage than was the case until recently, whereas dealers are quite firm in their demands regarding prices and declare stock is far from plentiful and that packers are refusing to accept orders at lower figures. It is not unlikely that some recession in prices, more especially on the low grades, will be witnessed during the next several weeks or as the customary quiet market period toward the end of the year approaches, although on the other hand, the market appears fairly well sold up and the supply condition may serve to maintain values.

Shavings are quoted at 3 to 3.25 cents per pound f. o. b. shipping points for No. 1 hard white, 2.75 to 3 cents for No. 2 hard white, and 2.70 to 3 cents for soft white shavings, depending on the quality of packing. The movement of heavy books and magazines has been quite steady and mills continue to pay 1.25 cents a pound f. o. b. New York for No. 1 stock, while as high as 1.15 cents at shipping points has been granted for No. 1 crumpled book stock. Old kraft is firm quotably at 2.10 cents for No. 1 packing, and some transactions involving extra quality kraft have been recorded in excess of this price. Ledger stock is quoted from 1.60 to 1.85 cents a pound, according to the packing.

Low grades have eased a trifle in price in the East to where mills report purchases of folded news at 65 cents per hundred pounds f. o. b. New York, and No. 1 mixed paper at 55 cents. However, higher prices than these prevail in the Middle West, and probably in a majority of cases 70 cents is being paid for news and 60 cents for mixed paper in the East. Corrugated stock is sought freely at 90 cents a hundred pounds for new corrugated box cuttings, and 75 to 80 cents for old corrugated boxes.

The following quotations are those named by dealers f. o. b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	3.00-3.25
Hard white shavings, No. 2	2.75-3.00
Soft white shavings	2.70-3.00
Colored shavings	1.25-1.50
Heavy book, No. 1	1.25-1.35
Crumpled book, No. 1	1.05-1.15
Ledger stock	1.60-1.85
Kraft, No. 1	2.00-2.15
New kraft cuttings	2.60-2.80
Manilas, No. 1	.90-1.00
White blank news	1.75-1.90
Overissue news, No. 1	.80- .90
Folded news	.65- .75
Sulphite mill wrappings	.80- .90
Old corrugated boxes	.75- .80
New corrugated box cuttings	.90-1.00
Mixed paper, No. 1	.55- .65
Common paper	.40- .50

Pulpwood

Reflecting in a measure the quietness obtaining in the ground wood market, demand for pulpwood is nothing more than routine at present, and there is a lack of interesting feature in the market. Quoted prices rule fairly steady, and reports generally tell of available supplies being ample.

During the first nine months of this year exports of pulpwood from Canada, practically all of which came to the United States, amounted to 1,356,164 cords, valued at $13,655,821, showing a considerable increase over the 1,112,764 cords of a value of $11,064,662 exported in the corresponding period of 1926.

GDC

If you plan to take up
the
Manufacture of

New Paper Specialties

or if you are confronted with color problems of any kind, such as fastness to light, fastness to alkali, two sidedness, please consult our newly equipped laboratories and our experienced staff.

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CHENEY
Pulp and Paper Co.
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Manufacturers of All Grades

Rag Pulp
and
Jute Pulp
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SUBMITTED UPON REQUEST

ROSIN SUPERIOR SIZE

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Twenty-two SUPERIOR Plants

The Most Extensive Organization of Its Kind in the World

Producing, Distributing and Servicing Chemical Products for the Pulp, Paper and Coating Trades

"There Is a SUPERIOR Plant Near You"

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Paper Makers Chemical Co., Easton, Pa., Holyoke, Mass.
Western Paper Makers Chemical Co., Kalamazoo, Mich., Pensacola, Fla., Jacksonville, Fla., Savannah, Ga., Comstock, Mich.
C. K. Williams & Company, Easton, Pa., Emeryville, Cal., Malaga, Spain.
Georgia-Louisiana Company, East Point, Ga., Marrero, La.
Superior Pine Products Company, Fargo, Ga., Tarver, Ga.
Empire Size & Chemical Co., Albany, N. Y.
Adirondack Mineral Co., Carthage, N. Y.
Superior Sizing Company, Lockport, N. Y.
Paper Makers Importing Co., Easton, Pa., St. Austell, Cornwall, Eng.
Vera Chemical Co. of Canada, Ltd., Freeman, Ontario
Vera Chemical Corporation, Stoneham, Mass.
Vera Chemical Company, North Milwaukee, Wis.
John Regnier & Son Company, Boston, Mass.
George S. Mepham & Company, East St. Louis, Ill.
Pochins & Paper Makers Chemicals, Ltd., Erith, Kent and Manchester, Eng.

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A FIRST REQUISITE

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Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

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The survival of the fittest

The easiest way to survive competition is to reduce the cost of production.

Our equipment will help you to do this:

Jenssen Acid Towers
Jenssen Spray Coolers
Bullard Gas Washer
Decker Cooking Process
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200 Fifth Ave., New York City

Mechanical Pulp

There are signs visible that the market for mechanical wood pulp is at last starting to show improvement. At any rate, consumers in certain instances are manifesting a little more buying interest, and, according to reports, more sales have been negotiated recently. It might be said, however, to use the vernacular, that the market is not yet "out of the woods" as demand is still well below normal and as prices rest on levels which afford virtually no profit to producers.

An interesting development in ground wood is the news just received by cable that Swedish manufacturers of mechanical pulp have agreed to sell their pulp through a single central sales organization, with a view of eliminating underselling and other market disrupting practices on the part of some mills in Sweden. This move should in greater stabilization of the ground wood market, not only in Europe but on this side of the Atlantic as well.

Current quotations on Canadian prime spruce ground wood range around $22 or $23 a ton f. o. b. pulp mills but it is stated purchases are being made at cheaper prices in some cases. Domestic ground wood is nominal in price at about $26 per ton at grinding plants. Quite a few sales of imported ground wood of Scandinavian origin have been reported lately on a price basis of $28 to $30 per short ton ex dock New York and other American Atlantic ports for dry pulp.

Mills in the United States produced a total of 67,136 net tons of mechanical pulp in August, contrasted with 70,409 tons in July, and had stocks on hand at the end of August aggregating 120,606 tons, against 142,217 tons at the close of July.

Chemical Pulp

Chemical wood pulp is reported moving rather steadily into consuming channels, although chiefly against contracts. Consumers in certain instances are buying currently in a moderate way but the demand at present is aggregately light. Moreover, producers are obliged to keep prices within competitive bounds of those prevailing on imported pulps, which is another manner of saying that prices are afforded little opportunity to rise.

Quotations on bleached sulphite are steady at 4 cents a pound upwards f. o. b. pulp mills for No. 1 quality, with extra grades priced at 4.25 cents and up to 4.75 cents. Strong unbleached sulphite of news grade is reported selling around 2.50 cents at producing plants, and book quality sulphite at 2.75 cents and higher. Bleached soda pulp is quoted at 3.25 cents per pound f. o. b. pulp mills, and No. 1 kraft pulp at 2.75 cents to a bit higher.

Production of chemical wood pulp in the United States in August amounted to 110,069 net tons, contrasted with 99,494 tons produced in the preceding month, while stocks at producing mills at the end of August totaled 20,127 tons, against 20,139 tons a month earlier, according to the monthly summary issued by the American Paper and Pulp Association.

Quotations f. o. b. pulp mills are as follows:

Bleached sulphite	4.00-4.75
Easy bleaching sulphite	2.80-3.00
Unbleached sulphite, No. 1 strong (news grade)	2.40-2.70
Unbleached sulphite, No. 1 book	2.70-3.00
Soda pulp, bleached	3.25-3.50
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

Chemicals

The contract season for some of the important papermaking chemicals is now under way, and interest in the market recently has centered on the announcement by leading producers of alkalies of a moderate reduction of prices of caustic soda and soda ash for delivery in 1928. The new contract basis on soda ash is 1.20 cents for bulk shipments, 1.32½ cents in bags and 1.57½ cents in barrels. Caustic soda is quoted at 3 to 3.10 cents per pound f. o. b. works. Bleaching powder is steady at a price range of 2 to 2.40 cents per pound at works. Quotations on brimstone are maintained at $18 to $20 per long ton for bulk lots at mines. Average quotations are as follows (See page 1421):

Starch

ECONOMY can never be mistaken for cheapness. In the matter of sizing material, starch is cheaper than an all-glue size, yet the results are identical—in fact, the paper made with starch sizing is stronger.

FOX HEAD NIAGARA SPECIAL PAPER

Our experts can show you how these starches can be used advantageously in your mill. They will gladly call on request.

Corn Products Refining Company
17 Battery Place New York

Starch

THE PULP BUYER WILL TELL WHY
Fidalgo System Dried and Shredded Pulp
(Air Dried)
IS THE ANSWER
Units 10 to 75 ton daily capacity.
Producing a compact air dry bale (suitable rail and water shipment 40-45 cu. ft. per ton) of shredded pulp.
33 1/3 SAVING AT BEATER

Wrapped Bale—Open

General Advantages No mechanical Pressure used until dry—upon cutting straps at Beater entire bale allowed to absorb rapidly. No surface on wet pulp during drying process. Only current of warm dehydrated air, produces a product that has its surface pores wide open for ready absorption in Beater and produces a pulp testing from 10 to 20 points higher than any pulp dried in sheet form.

Labor, Steam, Power, Etc. LESS LABOR than any cylinder or mechanical pressure dryer. Less than 2,500 lbs. steam required (either live or exhaust) per ton air dried pulp, with economizer pulp can be dried with waste stack gases.

Cleanliness Pulp being dried in closed insulated compartment—FIDALGO SYSTEM produces cleaner pulp.

Users Eight installations in United States and ten on order or under construction. Your inspection invited.

Cost Less than any Drying Method we know of to install.

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Uncle Jake says—

"Let's do all the business we can honestly, have all the fun we can reasonably, do all the good we can willingly and save our digestion by thinking pleasantly."

We honestly believe that our

KVP GENUINE VEGETABLE PARCHMENT

is the best made, and this without boasting.

We get a lot of fun out of our paper business because we are doing good by making it and selling it and our digestion is always in good working order because we think well of everybody.

KALAMAZOO VEGETABLE PARCHMENT CO. KALAMAZOO, MICH.

WE WILL BUY

Donnacona Paper Co. 6s, 1940	@	101
Donnacona Paper Co. Common	@	70
Dierks Lumber & Coal Co. 6s, 1936	@	99¾
Escanaba Paper Co. 6s, 1929	@	98
Fort William Paper Co. 6s, 1946	@	98
Hoberg Paper & Fibre Co. 7s, 1937	@	94
Long Bell Lumber Co. 6s, 1931	@	89
Missisquoi Pulp & Paper Co. 7s, 1929	@	98¾
North American Timber Holding Co. Pfd. (1911 issue)	@	22
Pacific States Lumber Co. 8s bonds & Ctfs.	@	OW
St. Anne Paper Co. 6½s, 1946	@	100
St. Regis Paper Co. Pfd.	@	104
United Paperboard Co. Pfd.	@	63
Westfield River Paper Co. 7s, 1937	@	90

WE WILL SELL

British Columbia Pulp & Paper 6s, 1950	@	88
Eastern Manufacturing Co. 7s, 1938	@	93
Great Northern Paper Co.	@	70
International Fibre Co. 8s	@	99
Marinette & Menominee Paper Co. 7½s	@	104½
Murray Bay Paper Co. 6½s, 1947	@	100
New England Lime Co. Pfd.	@	98
Salts Textile Co. 8s, 1936	@	BW
Watab Paper Co. 6½s, 1942	@	103

H. D. KNOX & CO.

44 Broad St., N. Y. 27 State St., Boston

Inquiries invited on all Paper Pulp Lumber Securities

Ham Feltz sez:

"It's been my observin' that it may be all right to say 'boys is boys' but you can't say 'felts is felts.' There's as much difference between any old kind of a felt and a Hamilton Felt as there is between one of those old rattle traps of 1900 and a 1926 latest model. You've got to try them to know how much better they is."

Hamilton Felts

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Industrial Engineers

Specializing in

LABOR COST REDUCTION AND MATERIAL HANDLING

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CHICAGO

New Papers

Writing—	
White rag	15-40
White sulphite	9-30
Colored rag	15-40
Colored sulphite	8-30
Ledger—	
White rag	16-40
White sulphite	9-30
Colored sulphite	8-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	7-30
Colored sulphite	7-30
Colored rag	15-40
Book—	
No. 1 S. & S. C.	6.35- 8.00
Machine finished	6.25- 8.00
English finished	6.25- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.00-15.00
Newsprint—	
Rolls, contract	3.25-.....
Rolls, transient	3.50-.....
Sheets	3.65- 3.80
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24x36	.70- .80
No. 1 manila, 24x36	.70- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	5.25- 5.50
Southern kraft	4.75- 5.00
Boards—	**New York and Chicago**
Solid news	55.00-60.00
Straw	52.50-57.50
Plain chip	47.50-50.00
White coated chip	55.00-60.00
Manila coated chip	55.00-60.00
Binder's board	70.00-75.00

Chemicals

(*Continued from page* 1419)

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	4.00 - 4.25
Bleaching powder	2.00 - 2.40
Brimstone (long ton; at mine)	18.00 -19.00
Casein (duty paid)	17.00 -18.50
Caustic soda, spot delivery	3.00 - 3.10
China clay, domestic washed	8.00 -10.00
China clay, foreign	14.00 -20.00
Rosin, Grade E	9.00 - 9.20
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½-.....
Starch, papermakers', in bags	3.07 -.....
Talc (ton)	16.00 -18.00

Market Quotations

Issued by H. D. Knox & Co., 44 Broad St., New York

	Bid	Asked
Abitibi Fibre Co. 6s, 1947	97½	
Abitibi Power & Paper Co. 6s, 1940	104½	105½
Abitibi Power & Paper Co. 6s, 1930	107	
Abitibi Power & Paper Co. 6s, 1931	101	102
Abitibi Power & Paper Co. 6s, 1950	99¾	100½
Advance Bag & Paper Co. 7s, 1943	105	106
American Sales Book Co. 6s, 1939	102½	
American Writing Paper Co. 6s, 1947	92½	
American Writing Paper Co. 6s, 1939	82	
American Book Co. 6s, 1928	100	101
Beaver Products 7½s, 1942	109	
Bedford Pulp & Paper 6½s, 1942	98	
Brown Paper Mills Co. 6s, 1935-41		100
British Columbia Pulp & Paper 6s, 1940	87	91
British Columbia Pulp & Paper 6s, 1950	87	90
Belgo Canadian Paper Co. 6s, 1942	101¼	103
Brown Co. 5½s, 1946	100	102
Brompton Pulp & Paper Co. 6s, 1942	102	
Brompton Pulp & Paper Co. 6s, 1946	101	103
Canadian Paper Co. 6s, 1946	98	
Canadian Paperboard Co. 7s, 1937	98	101
Cape Breton Pulp & Paper 6s, 1932	101	103
Celotex Co. 6½s, 1939	100½	102
Central Paper Co. 6½s, 1941	84	85½
Central Paper Co. 6½s, 1930	87	
Central Paper Co. 7s, 1932	86	88
Celotex Co. 6s, 1929	100	103
Celotex Co. 6s, 1936	97½	
Champion Fibre Co. 6s, 1941	100½	101¼
Champion Paper Co. 6s, 1935	95	97
Champion Coated Paper Co. 6s	99½	
Container Corp. of America 6s, 1936	98	
Continental Paper Products 6½s, 1942	89	92
Continental Paper & Bag Co. 6½s, 1944	80¾	
Crown Williamette Paper Co. 6s	101¾	102½
Dells Paper & Pulp Co. 6s	95	
Donnacona Paper Co. 6s, 1940	101	102
Eastern Manufacturing Co. 7s, 1938	90	92
Eddy Paper Co. 7½s, 1931	103½	
Escanaba Paper Co. 6s, 1939	94	96
Escanaba Paper Co. 5s, 1928	99	100
Filer Fibre Co. 7s	94	98
Fort Orange Paper Co. 7s, 1942	101	103
Fort William Paper Co. 6s, 1946	98	100
Fort William Paper Co. 6s, 1931	100	
Gair (Robt.) 5½s, 1942	97	
Gilber Paper Co. 6½s	90	
Hartje Paper Co. 6s	1½	
Hammermill Paper Co. 6s, 1939	100	102
Hoberg Paper & Fibre Co. 7s, 1937	94	96
Howard Smith Paper Co. 7s, 1941	104	105
Industrial Fibre Co. 8s	96	
International Paper Co. 6s, 1941	106	
Itasca Paper Co. 6s	97	
Itasca Paper & Prairie River 5½s	96	
Kalamazoo Vegetable & Parchment 6s, 1938	99	
Kieckhefer Container 5½s, 1928-37		99½
Lake St. John Power & Paper 6½s, 1942 (with bonus)	95	98
Lake Superior Paper Co. 6s, 1941	104	
Marathon Paper Mills, 5½s	100	
Manitoba Paper Co. 6½s	98	99½
Marinette & Menominee Paper Co. 7½s, 1936	103	104½
Mead Pulp & Paper Co. 5s	93	96
Menasha Printing & Carton 6½s, 1939	100	
Mengel Co 7s, 1934	103	
Minnesota & Ontario Paper Co. 6s, 1931	96	98
Minnesota & Ontario Paper 6s, 1950	97½	
Minnesota & Ontario Paper Co. 6s, 1945	97½	
Minnesota & Ontario Paper Co. 6s, 1930-5	95	98
Minnesota & Ontario Paper Co. 6s, 1948	95¾	99¼
Michoacan Pulp & Paper Co. 6s, 1945	95	
Michoacan Pulp & Paper Co. 7s, 1929	100	
Monroe Paper Products 7½s, 1932	97	
Munising Paper Co. 6s	96½	100
Mekoosa Edwards 6s	96½	100
Mississquoi Pulp & Paper Co. 7s, 1929	98¾	
Ontario Paper & Pulp Co. 6s, 1931	108	110
Orono Pulp & Paper Co. 6s	98	
Oswego Falls Paper Co. 6s, 1941	99	102
Oswegatchie Paper Co. 6s		BW

(*Continued on page* 1429)

The B Co. INC. QUALITY PULPS

HAFSLUND NORWAY — "HAFSLUND BEAR" Bleached Sulphite

F: HAGA — "FORSHAGA" Bleached Sulphite

KRAFT HURUM NORWAY SPECIAL — "HURUM SPECIAL" Extra Strong Kraft

KOOS BAC — "BAMBLE" Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

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Incorporated
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BATHURST LUMBER COMPANY, LIMITED

PRICE & PIERCE, LTD.
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ARE NOW THE

SELLING AGENTS
for Bathurst Pulp in the United States

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

PERKINS-GOODWIN CO.

Established 1846

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UNITED STATES AGENTS
FOR

SPAULDING PULP & PAPER CO.

NEWBERG, OREGON

MANUFACTURERS
OF

PRIME STRONG
UNBLEACHED SULPHITE PULP
SHREDDED AND HOT AIR DRIED

Now accepting orders for late fall deliveries

EXPORTS

Exports of paper from the United States during August, 1927, were slightly smaller, in point of value, than in the preceding month, and also recorded a decline from the value of exportations in the corresponding month last year, according to official statistics issued by the U. S. Department of Commerce in Washington. Total exports of paper of all kinds in August amounted in value to $2,076,879, compared with $2,200,364 in July last, and $2,214,844 in August a year ago. During the first eight months of this year paper exports from this country reached a total value of $18,146,-152, showing a little increase over the export shipments valued at $17,930,595 in the similar period of 1926.

Exports of newsprint in August gained over July, and amounted to 2,430,928 pounds of a value of $116,872, contrasted with 1,966,603 pounds of a value of $92,691 in the preceding month, and 2,411,461 pounds of a value of $151,-548 in August, 1926. The largest shipments in August last were to Canada, 499,684 pounds; to South America, 494,148 pounds, and to Cuba, 469,486 pounds. Exports of book paper, not coated, in August amounted to 977,156 pounds, valued at $97,130, against 1,694,424 pounds of a value of $139,629 exported in the preceding month, and 1,566,942 pounds of a value of $134,843 in August last year.

Wrapping paper exports from the United States in August were 2,129,775 pounds, valued at $151,512, showing a loss from the 2,657,904 pounds of a value of $181,238 exported in the similar month a year ago. Shipments of writing paper, on the other hand, recorded a gain, amounting to 1,254,347 pounds of a value of $174,863 in August last, compared with 843,635 pounds of a value of $138,758 in August last year. Box board exports showed a sharp decline from 6,234,874 pounds of a value of $178,066 in August, 1926, to 2,892,883 pounds of a value of $95,842 in August this year, while exports of other paper board and straw board were 2,818,202 pounds of a value of $149,120 in August last, against 3,549,348 pounds of a value of $164,906 in August a year ago. Exports of toilet paper in August last amounted to 527,082 pounds, valued at $57,936, recording an appreciable increase over the 393,753 pounds of a value of $51,824 exported in the same month last year.

IMPORTS

Wood Pulp

Reports are to the effect that demand for imported wood pulp has increased slightly. Paper and board manufacturers who have encountered a better call for their product have been obliged to buy pulp in some cases in a little larger volume, and the market has benefited thereby. The situation, however, is not all to the liking of those on the selling side of the trade, demand ruling comparatively quiet for this time of the year and consumers in a majority of instances exerting such caution in buying that they appear at times picayune in their attitude. It would seem, on the other hand, that the bottom levels have been witnessed for pulp prices for a while, and opinion is confident in the trade that any changes during the next few months or during the winter season that happen to occur will be in an upward direction. The markets abroad are reported stiffening with producers showing less inclination to shade prices or to grant any further concessions, and in frequent cases Scandinavian mills are bent on securing better prices for their pulps.

There is a steady demand for certain mill brands of sulphite or kraft pulp or those grades which are well known in this country and which paper manufacturers in the United States are accustomed to using. In most instances, such brands are well sold up, not alone for the balance of this year but also for the new year. Consumers here are absorbing such quantities of these pulps as are offered from primary sources, and exhibit little hesitancy about meeting the prices asked so long as they are within market quotational bounds. On the other hand, offerings of some grades of pulp of qualities which they are not thoroughly familiar recognized market levels, and buyers display little desire to purchase, evidently not being ready to acquire supplies of pulp of qualities which they are not thoroughly familiar with.

Imports of chemical wood pulp into the United States continue on a high level. Receipts during August were next to the largest in any month this year up to that time, amounting to 106,548 long tons of all grades of chemical, valued at $6,411,655, compared with 105,148 tons of a value of $6,586,808 imported in July last, and 121,063 tons of a value of $7,868,353 in August a year ago. The August imports brought the total for the first eight months of the current year up to 792,548 long tons, giving a monthly average of 99,068 tons, against 104,458 tons average in the same period last year. Ground wood imports in August amounted to 16,604 long tons, contrasted with 11,914 tons in the preceding month, and 23,829 tons in the corresponding month last year, and made a total of 127,443 tons in the first eight months of this year, compared with 162,645 tons imported in the similar period of 1926.

Prime strong unbleached sulphite of foreign origin is selling at 2.50 cents per pound ex dock New York or other American Atlantic ports. Occasional transactions at slightly below this price are reported but on the other hand choice qualities of sulphite are fetching 2.60 to 2.70 cents and higher. Prime bleached sulphite is quoted at 3.50 cents a pound upward, and some purchases at a trifle under this basis have been made. Easy bleaching sulphite is quoted at 2.85 to 2.90 cents for the best known brands ex dock New York, and ordinary Mitscherlich unbleached sulphite at 2.45 cents. Prime Swedish kraft pulp is steady at 2.70 cents per pound on the dock. Improved demand for ground wood is reported and sales of dry prime ground wood of Scandinavian manufacture at $28 and $30 per ton ex dock New York have been made.

Current market quotations ex dock New York and receipts at the port of New York during October follow:

Bleached sulphite, No. 1	3.40- 4.00
Unbleached sulphite, strong No. 1	2.45- 2.75
Unbleached sulphite, No. 2	2.35- 2.50
Easy bleaching sulphite	2.80- 3.00
Mitscherlich unbleached, genuine	2.90- 3.15
Mitscherlich unbleached, ordinary	2.40- 2.65
Kraft, standard Swedish	2.65- 2.90
Ground wood, per ton (dry)	28.00-30.00

Bulkley, Dunton & Co., 490 bls. from Trieste, 900 Hernosand, 3,125 Stugsund, 1,875 Iggesund, 254 Hamburg, 4,423 Sundsvall, 3,000 Soderhamn, 4,250 Gefle and 850 Rotterdam; Parsons & Whittemore, 120 bls. from Gothenburg; American Exchange Irving National Bank, 539 bls. from Trieste and 250 Bremen; E. J. Keller Co., 849 bls. from Hamburg and 375 Karsruhe; Atterbury Bros., 1,625 bls. from Oslo, 1,000 Gothenburg, 500 Greaker and 300 Stockholm; Chemical National Bank, 3,200 bls. from Oslo and 1,500 Iggesund; E. M. Sergeant Co., 2,700 bls. from Hernosand and 3,344 Gothenburg; First National Bank of Boston, 6,000 bls. from Sikea; J. Anderson & Co., 3,000 bls. from Stugsund, 12,100 Hernosand, 1,575 Hamburg, 1,020 Greaker, 823 Trieste, 2,500 Soderhamn, 250 Gothenburg and 7,500 Gefle; M. Gottesman & Co., 2,500 bls. from Iggesund, 2,000 Hamburg and 1,000 Sundsvall; Woodpulp Service Corp., 250 bls. from Gothenburg; Castle & Overton, 2,258 bls. from Bremen and 798 Sundsvall; Perkins-Goodwin Co., 1,250 bls. from Oslo, 254 Copenhagen, 150 Sundsvall and 875 Gothenburg; Johaneson, Wales & Sparre, 2,614

The Pulp and Paper Trading Co.

21 East 40th Street New York City

Dealers in
Domestic Chemical and Mechanical Pulps and Paper

AGENTS FOR
J. & J. ROGERS COMPANY, Ausable Forks, N. Y.
E. B. EDDY COMPANY, LTD., Hull, Canada
CANADIAN KRAFT LIMITED, Three Rivers, Canada
Dealers in Waysgamack Kraft Pulp

Howard Smith Paper Mills, Montreal, Quebec
EASTERN AGENTS of Sulphite Pulp
Made by Port Huron Sulphite & Paper Co., Port Huron, Mich.

J. ANDERSEN & CO.

21 East 40th Street New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden

THE WATERBURY FELT CO.

SKANEATELES FALLS
New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

MITTS & MERRILL GRAVITY FEED SHREDDER

Reduces Paper Stock

Magazines, books, old paper and boxboard, frozen or dried pulp laps run through the Mitts & Merrill Gravity Feed Shredder are reduced to particles which hydrate readily when put into the beaters.

Built in six sizes with spouts ranging from 18" to 45" wide

Reduces Cost

Because shredding in the Mitts & Merrill Gravity Feed Shredder expedites hydration in the beaters there is considerable saving made in power. Thus we see that the shredder here illustrated reduces costs while it is reducing paper stock.

We will be glad to furnish details upon request.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse

See pages 368 and 369 in the 1927 Paper and Pulp Mill Catalogue

MITTS & MERRILL 1013 Tilden St. SAGINAW, MICH.

bls. from Sundsvall; Scandinavian Pulp Agency, 10,600 bls. from Sundsvall, 1,475 Skutskar, 250 Gefle and 34 Gothenburg; Pagel, Horton & Co., 3,000 bls. from Hernosand and 2,250 Gefle; Buck, Kiaer & Co., 1,200 bls. from Stockholm and 480 Oslo; Central National Bank, 750 bls. from Sundsvall; Equitable Trust Co., 109 bls. from Antwerp and 5,500 Norrsundet; Lagerloef Trading Co., 610 bls. from Hamburg; Brown Bros. & Co., 500 bls. from Helsinfors; Price & Pierce, 825 bls. from Gothenburg; Order, 1,045 bls. from Bremen, 1,682 Wiborg, 584 Hamburg, 2,250 Graeker, 2,836 Kotka and 1,320 Oslo.

Paper Stock

The feature in the United States import trade in papermaking materials during October was the sharp decline in receipts of rag stock. Probably a smaller total of rags was imported last month than in any month in a long time, judging from manifests of steamers arriving at the port of New York. Imports of old rope and bagging also were lighter than normally, only comparatively small quantities of these papermaking materials reaching New York during the month.

Papermaking rag imports have been falling off steadily in recent months. Government figures show that in the first eight months of this year imports of rags for papermaking purposes totaled 250,076,494 pounds, valued at $5,168,875, showing a marked decline from the 333,078,092 pounds of a value of $7,408,180 imported in the corresponding period last year. Imports of waste bagging and waste paper in the same time amounted to 63,438,358 pounds, against 81,294,394 pounds in the similar period a year ago, while imports of old rope and miscellaneous paper stock were 43,549,965 pounds, contrasted with 59,766,988 pounds in the same period of 1926.

Imports of all kinds of paper stock other than wood pulp at New York in October, 1927, these data being taken from manifests of steamers reaching that port during the month, follow:

Old Rope—E. J. Keller Co., 133 bls.; Equitable Trust Co., 255 coils and 17 bls.; Brown Bros. & Co., 271 bls. and 452 coils; American Express Co., 144 coils; Ellerman's Wilson Line, 80 coils, H. J. Reed, 68 bls.; R. M. Gray, Inc., 9 bls.; Montell & McDonough, 5 bls.; W. Schall & Co., 200 coils; Union National Bank, 194 coils, Order, 14 coils.

Old Bagging—Castle & Overton, 157 bls.; Bank of New York & Trust Co., 78 bls.; Darmstadt, Scott & Courtney, 292 bls.; National City Bank, 165 bls.; A. W. Fenton, Inc., 146 bls.; Bank of the Manhattan Co., 73 bls.; British Bank of South America, 117 bls.; Chase National Bank, 114 bls.; Chemical National Bank, 29 bls.; E. Vermette, 61 bls.; E. J. Keller Co., 299 bls.; Order, 467 bls.

Rags—Darmstadt, Scott & Courtney, 43 bls.; A. Benoni, 100 bls.; Victor Galaup, Inc., 1,442 bls.; Salomon Bros. & Co., 153 bls.; W. Lowenthal & Co., 29 bls.; E. Mayer, 51 bls.; Castle & Overton, 64 bls.; I. Hinerfeld, 6 bls.; A. H. Searle, Inc., 28 bls.; J. Cohen & Sons, 38 bls.; Daniel M. Hicks, Inc., 85 bls.; Katzenstein & Keene, 78 bls.; David Galloway, Inc., 125 bls.; C. Harley & Co., 40 bls.; Romeo Canoval & Sons, 94 bls.; E. A. Stone Co., 29 bls.; Jaffe Products Co., 60 bls.; P. Garvan, Inc., 115 bls.; E. J. Keller Co., 1, 317 bls.; American Exchange Irving Trust Co., 35 bls.; Equitable Trust Co., 1,468 bls.; Fidelity Trust Co., 63 bls.; Chase National Bank, 279 bls.; Atlantic National Bank, 44 bls.; Central National Bank of Cleveland, 8 bls.; Philadelphia Girard National Bank, 211 bls.; State Bank, 17 bls.; Bank of New York & Trust Co., 415 bls.; Chemical National Bank, 8 bls.; American Overseas Corp., 147 bls.; Brown Bros. & Co., 227 bls.; A. W. Fenton, Inc., 1,417 bls.; Goldman, Sachs & Co., 264 bls.; J. T. Lodge Co., 13 bls.; American Express Co., 158 bls.; Order, 1,442 bls.

Miscellaneous Paper Stock—Castle & Overton, 196 bls.; Bank of the Manhattan Co., 45 bls.; American Merchant Lines, 280 bls.; J. Cohen & Sons, 116 bls.; Salomon Bros. & Co., 54 bls.; Robert Bishop Mfg. Co., 197 bls.; Crane & Co., 8 bls.; Chase National Bank, 390 bls.; Chemical National Bank, 26 bls.; National City Bank, 198 bls.; Kidder Peabody Acceptance Corp., 1,148 bls.; Equitable Trust Co., 241 bls.; W. Schall & Co., 163 bls.; William Steck & Co., 77 bls.; Darmstadt, Scott & Courtney, 374 bls.; Milton Snedeker Corp., 73 bls.; George M. Graves Co., 172 bls.; National Bank of Commerce, 156 bls.; Meyer & Co., 132 bls.; American Express Co., 12 bls.; Goschens & Cunliffe, 255 bls.; Guaranty Trust Co., 35 bls.; S. Birkenstein & Sons, 192 bls.; Bulkley, Dunton & Co., 144 bls.; Philadelphia Girard National Bank, 98 bls.; Bankers Trust Co., 36 bls.; R. F. Downing & Ca., 55 bls.; E. J. Keller Co., 737 bls.; Order, 780 bls.

Paper

According to official statistics issued by the U. S. Department of Commerce in Washington, paper imports into the United States in August showed an increase in value over imports both in the preceding month and the corresponding month of 1926. Imports of paper of all kinds last August were valued at $12,578,414, contrasted with imports of a value of $12,071,968 in July last, and $12,031,450 in August a year ago. During the first eight months of the current year paper imports reached a value of $96,248,597, recording an appreciable gain over the imports valued at $90,734,682 in the same period of 1926.

Paper imports into the U. S. were moderately large in

1 Heavier Furnishes
2 Faster Beating
3 Greater Output
4 More Uniform Product
5 Saving in Power
6 Saving in Labor

Not One— But all Six

The acceptance of Dayton High Speed equipment—either new or holland engines reconstructed into Daytons—is based upon all six of the above advantages and not upon "speed" alone. Superintendents in mills that use them will tell you so. Write some of them. A list of the mills will be furnished for that purpose.

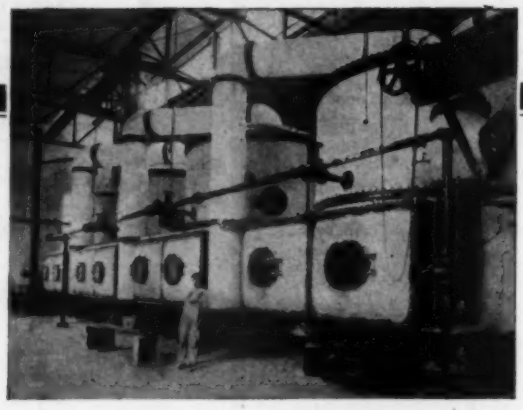
Also get the series of analytical surveys recently prepared by A. C. Nielsen Company, of Chicago. These surveys will give you exact facts, figures and percentages on what Daytons are doing in several mills. Write for them.

DAYTON
High Speed Beaters

The Dayton Beater & Hoist Co.,
Dayton, Ohio

E. K. Mansfield & Co.,
501 5th Ave., New York, N. Y., Eastern Reps.

ZAREMBA



The largest quadruple effect evaporator for handling neutral sulphite waste liquor—

That is . . . . to our knowledge. Installed in 1917 it has given satisfactory service and caused no worry to its owner. Our apparatus can be installed with any designed margin of increased capacity—not only that, but the policy of Zaremba Engineers—to design each installation to meet specific conditions—has been responsible for its success.

ZAREMBA COMPANY
168 Franklin St., Buffalo, U. S. A.

New York City Office: 95 Liberty St.

80 YEARS'—
Experience in Making Dryer Felts

FITCHBURG Cotton Dryer Felts have conformed to the highest standards of quality and workmanship for over eighty years. This is one reason why today they are used so extensively.

¶ Manufactured in English weave, two, three, four, five and six ply, from 60 to 210 inches in width.

¶ Fine faced felts for fine papers. For coarse papers, use "Triune" three-ply Felts —**they're dependable.**

FITCHBURG DUCK MILLS
ESTABLISHED 1844
54 Duck Mill Road FITCHBURG, MASS.

1864 1927

"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

Sold by
BULKLEY, DUNTON & COMPANY
75-77 Duane Street, N. Y.
and direct

October, judging from receipts through the port of New York. Some sizable consignments of printing paper arrived in that month, and shipments of straw board continued rather heavy. Usual amounts of cigarette, filter, hanging and other classes of paper were received. Imports of paper of all kinds at the port of New York in October, 1927, these data being taken from manifests of steamers arriving at that port during the month, follow:

Printing—Perkins-Goodwin Co., 48 rolls, 44 bls. and 67 cs. from Hamburg and 832 rolls from Bremen; B. F. Drakenfeld & Co., 120 cs. from Liverpool; E. Dietzgen & Co., 63 cs. from Hamburg and 80 cs. Rotterdam; Journal of Commerce, 235 reels from Wiborg; Steiner Paper Corp., 69 cs. and 53 bls. from Rotterdam and 55 bls. Oslo; Manufacturers Trust Co., 33 cs. from Hamburg; Keuffel & Esser Co., 167 rolls from Hamburg; New Haven Times-Union, 211 reels from Gothenburg; M. Gottesman & Co., 382 reels from Gothenburg; A. S. Zabriskie, 228 reels and 44 bls. from Bremen; C. B. Richard & Co., 64 bls. from Hamburg; F. Henjes, Jr., 124 reels from Hamburg; P. Puttmann, 18 cs. from Antwerp; Lloyd Royal Belge, 12 cs. from Antwerp; Walker, Goulard, Plehn Co., 604 bls. from Hamburg and 156 cs. Bremen; Hudson Trading Co., 317 rolls from Sundsvall and 214 reels Gothenburg; P. C. Zuhlke, 11 cs. from Rotterdam and 3 cs. Antwerp; Jewish Daily News, 108 reels from Gothenburg; H. Reeve Angel & Co., 152 bls. from Gothenburg; Martin & Beihtold, 7 cs. from Bremen; J. Henschel & Co., 11 cs. from Hamburg; W. Hartmann & Co., 175 bls. from Hamburg; Order, 34 reels and 137 bls. from Hamburg and 2,609 reels and 285 cs. from Bremen.

Wrapping—D. S. Walton & Co., 351 bls. from Bremen; Birn & Wachenheim, 63 cs. from Antwerp and 10 bls. Hamburg; Wilkinson Bros. & Co., 439 rolls from Bremen and 20 rolls and 45 bls. from Gothenburg; Insight Paper Co., 306 reels from Oslo; Borregaard Co., 1,459 reels from Gothenburg; E. Dietzgen & Co., 21 cs. from Hamburg; F. C. Strype, 11cs. from Antwerp; M. M. Cohen, 115 bls. and 200 reels from Gothenburg; Thomas Barrett & Son, 166 bls. from Gothenburg; C. K. MacAlpine & Co., 151 bls. from Gothanburg; Arkell Safety Bag Co., 528 rolls from Gothenburg; Eastchester Paper and Cordage Co., 25 bls. from Gothenburg; Eshbee Corp., 18 cs. from Antwerp; Beekman Card and Paper Co., 11 cs. from Rotterdam; Order, 400 bls. from Antwerp and 178 bls. and 69 rolls from Bremen.

Cigarette—Standard Products Corp., 261 cs. from Havre; DeManduit Paper Corp., 394 cs. from Havre and 800 cs. from St. Nazaire; British-American Tobacco Co., 10 cs. from Liverpool and 12 cs. Havre; R. J. Reynolds Tobacco Co., 400 cs. from Havre and 1,555 cs. St. Nazaire; Mallory Steamship Line, 4 cs. from Barcelona; P. J. Schweitzer, Inc., 88 cs. from Marseilles and 2 cs. Havre; Reiss Premier Pipe Co., 10 cs. from Bordeaux; Order, 109 cs. from Marseilles.

Writing—Gulbont Freres & Co., 15 cs. from Havre; Distinctive Writing Paper Co., 7 cs. from Havre; J. W. Hampton Jr. & Co., 7 cs. from Havre; Stern Bros., 4 cs. from Havre; Globe Shipping Co., 5 cs. from Havre; F. L. Kraemer & Co., 3 cs. from London; E. Dietzgen & Co., 13 cs. from Marseilles.

Filter—J. Manheimer, 104 bls. from Southampton; C. Sleicher & Scholl Co., 12 cs. from Hamburg; E. Fougera & Co., 70 cs. from Southampton and 66 cs. Bordeaux; H. Reeve Angel & Co., 85 bls. from Southampton and 20 cs. London; A. Giese & Son, 40 bls. from Southampton.

Drawing—International Forwarding Co., 21 cs. from Antwerp; Favor, Ruhl & Co., 2 cs. from Havre; Keuffel & Esser Co., 104 cs. from Hamburg, 5 cs. Rotterdam and 2 cs. Southampton; H. Reeve Angel & Co., 8 cs. from Southampton and 8 cs. London.

Tissue—Schenkers, Inc., 73 cs. from Hamburg; F. B. Vandegrift & Co., 35 cs. from Liverpool; Order, 50 cs. from Hamburg.

Hanging—A. C. Dodman, Jr., & Co., 102 bls. from Southampton and 103 bls. Liverpool; C. A. Haynes & Co., 15 bls. from Liverpool and 42 pkgs. London; W. H. S. Lloyd & Co., 2 cs. from Liverpool; R. F. Downing & Co., 5 cs. from Havre; F. J. Emmerich & Co., 6 bls. from Hamburg and 12 bls. from Liverpool; Wedeman, Goldknecht & Lally, 3 pkgs. from Hamburg; F. Blank & Co., 11 cs. from Hamburg; Atlantic Forwarding Co., 2 cs. from Southampton; S. H. Pomerance, 2 cs. from Southampton; Order, 6 cs. from London.

Photo—P. C. Zuhlke, 303 cs. from Antwerp; American Express Co., 100 cs. from Antwerp; Globe Shipping Co., 576 cs. from Bremen; P. Puttmann, 78 cs. from Antwerp; Gevaert Co. of America, 28 cs. from Antwerp; J. J. Gavin & Co., 5 cs. from Liverpool; Medo Photo Supply Corp., 4 cs. from London; Order, 49 pkgs. from Antwerp and 199 cs. Bremen.

Board—Guaranty Trust Co., 191 rolls from Antwerp; Bendix Paper Co., 15 cs. from Hamburg; Lagerloef Trading Co., 995 bls. from Hamburg and 80 bls. Bremen; Adrian Vuyck, 1,199 reels from Rotterdam; Haas Bros., 884 reels from Rottendam; Fibre Case & Novelty Co., 97 bls. from Gothenburg; State Bank, 240 reels from Rotterdam; Robert Wilson Paper Corp., 508 reels from Rotterdam and 127 rolls Antwerp; Perkins-Goodwin Co., 700 rolls from Rotterdam and 149 reels Hamburg; J. P. Heffernan Paper Co., 245 rolls from Rotterdam; K. Hagenbacher, 104 cs. from Hamburg; C. K. MacAlpine & Co., 11 bls. from Gothenburg; O. M. Baxter, Inc., 26 cs. from Gothenburg; C. H. Powell & Co., 20 rolls from Antwerp; Globe Shipping Co., 36 cs. from Havre; Chatham & Phenix National Bank, 9 bls. from Gothanburg; A. B. Massa Paper Corp., 760 pkgs. from Rotterdam; M. H. Wolff, 195 pkgs. from Rotterdam; Spaulding & Tewksbury, 105 reels from Rotterdam; Coty, Inc., 60 cs. from Havre; Order, 354 reels from Rotterdam, 58 bls. Hamburg and 25 cs. Gothenburg.

Miscellaneous—Whiting-Patterson Co., 29 cs. from Southampton and 39 rolls Bremen; Japan Paper Co., 37 cs. from Havre, 57 cs. Genoa, 4 cs. London, 20 cs. Southampton and 13 cs. Rotterdam; Heemsoth, Basse & Co., 11 cs. from Antwerp and 50 cs. Hamburg; R. F. Downing & Co., 2 cs. from Havre and 29 cs. Bremen; Pennsylvania Railroad Co., 2 cs. from Havre; Keller-Dorian Paper Co., 68 cs. from Havre; Pearson, Poppard & Co., 2 cs. from Havre;

WATCH YOUR PAPER TESTS!

DOES your paper come through the tests with flying colors or is there danger of rejection?

Do you realize that the quality of paper as to surface, strength, texture, folding and thickness can be traced back to the quality of the Fourdrinier Wire used?

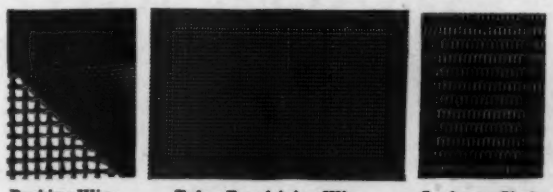
You cannot make dependable "high test" paper with an inferior Fourdrinier Wire. You must use a dependable wire—one that will run straight and true, that is accurately and firmly woven, that will not sag or wrinkle prematurely, and that will give long service without becoming slack at the edges.

Many superintendents know from experience that the kind of Fourdrinier Wire they use shows up in the paper tests—that's why they specify "Tyler" Fourdrinier Wires.

Let us send you samples.

Supplied in all widths up to and including 250 inches

The W. S. TYLER COMPANY, *Cleveland, O.*



Backing Wire | Tyler Fourdrinier Wire | Corduroy Cloth

TYLER WIRES

STANDARD-FLANGED-WOOD PIPE

Patent Applied for

Manufactured by

MICHIGAN PIPE COMPANY

Office and Factory: Bay City, Michigan

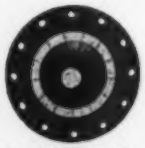
PRODUCTS:

Pipe for conveying—Pure Water, Acid Water, White Water, Sulphite Waste Water, Paper Stock, Ground Wood Pulp, Gases

SPECIAL FITTING FOR ACID WORK WRITE FOR CATALOG

Michigan Pipe for Paper Mills

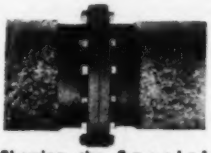
Liquid Conveyed Touches No Metal



Special Flange for Paper Mills.

ADVANTAGES:

Saves Power
No Discoloration
Lasting Qualities
Light in Weight
Cheaper.



Showing the Special Flange Joint, Light in Weight, Specially Desired for Inside Installations. Easy to Take Apart

SERVICE:

We maintain experts who will take entire charge of pipe installations if desired.

"PRECISION"—

The Essence of Success

Represented By "TANNITE" Deckle Straps

Mfg. By

STOWE & WOODWARD COMPANY

Newton Upper Falls, Mass.

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich.

INTERNATIONAL TRADING CO., Philadelphia, Pa.

Meadows, Wye & Co., 6 cs. from Havre; Judson Freight Forwarding Co., 10 cs. from Havre; F. L. Kraemer & Co., 15 cs. from Bremen, 8 cs. Southampton and 6 cs. London; Perry Ryer & Co., 89 cs. from Glasgow; D. C. Andrews & Co., 174 cs. from Hamburg; P. H. Petry & Co., 11 cs. from Hamburg, 10 cs. Rotterdam and 8 cs Havre; Friedman & Slater, 4 cs. from Hamburg; E. M. Sergeant Co., 4 cs. from Gothenburg; W. J. Byrnes & Co., 8 cs. from Liverpool; Birn & Wachenheim, 10 bls. from Hamburg; S. Gilbert, 27 cs. from Rotterdam and 25 cs. Bremen; S. Haufling & Co., 50 bls. from Hamburg; H. D. Catty & Co., 3 cs. from Antwerp and 6 cs. Rotterdam; E. V. Hadley, 15 cs. from Hamburg; Sinclair & Valentine, 4 cs. from Hamburg; Bendix Paper Co., 98 cs. from Hamburg; G. W. Sheldon & Co., 4 cs. from Southampton; J. A. Hearn & Sons, 3 cs. from Havre; C. H. Boulin, 15 cs. from Havre; Whitfield Paper Works, 25 cs. from Kobe; Banca Commerciale Italiana Trust Co., 65 cs. from Hamburg; C. R. Spence & Co., 6 cs. from Havre; Coenca-Morrison Co., 7 cs. from Havre; Tamm & Co., 2 cs. from Hamburg and 13 cs. Rotterdam; Schmidt, Pritchard & Co., 2 cs. from Hamburg; International Forwarding Co., 14 cs. from Hamburg and 15 cs. Rotterdam; J. E. Bernard & Co., 7 cs. from Bremen; Rohner, Gehrig & Co., 4 cs. from Bremen; Hudson Forwarding & Shipping Co., 16 cs. from Havre; F. Murray Hill, Inc., 27 cs. from Bremen, Phoenix Shipping Co., 3 cs. from Bremen and 8 cs. Hamburg.

ions

(from page 1421)

	Bid	Asked
.....	102	104
.....	102	104
.....	100½	
.....	97¼	99
aper 6s, 1938.....	101	102
Fibre Co. 6s, 1942.....	102½	
& Paper Co. 6s, 1942.....	101½	102½
6s, 1932.....	105	
..st Paper Co. 6s, 1941.....	101½	
Queen City Paper Co. 7s, 1933.....	97½	100
Richardson Co. 6s, 1938.....	100	
Riordan Pulp & Paper Co. 6s, 1931.....	100½	102½
Riordan Pulp & Paper Co. 6s, 1942.....	100	101½
River Raisin Paper Co. 6s, 1936.....	98½	
Roland Paper Co. 6s, 1937.....	99	
Spanish River Paper Co. 8s, 1941.....	107½	110
St. Anne Paper Co. 6½s, 1946.....	100	
St. Regis Paper Co. 6s, 1931.....	100½	100⅝
St. Lawrence Paper Mills 6s, 1946.....	97	99
Stevens & Thompson Paper 6s, 1942.....	93	94
Sauquoit Paper 6½s, 1938.....	95	97
Taggart Bros. 6s, 1944.....	95	100
Tait Paper & Color Industries 6s, 1934.....	90	92
Ticonderoga Pulp & Paper 6s, 1940.....	99	
Tomahawk Craft Paper Co. 7s, 1928.....	95	98
Tonawanda Paper Co. 5½s.....	100½	
United Wall Paper Co. 6s, 1947.....	97	99
Warren (S. D.) Co. 6s, 1945.....	102½	104
Watab Paper Co. 6½s, 1942.....	102	103
Wayagamack Paper & Pulp 6s, 1951.....	99	
Western Quebec Paper 6½s, 1948.....		75
Whitaker Paper Co. 7s, 1942.....	107⅛	108
Whitman Parsons Pulp & Lumber Co. 8s Units..	45	50
Westfield River Paper Co. 7s.....	90	93
STOCKS		
Advance Bag & Paper Co. Pfd.....	98	
Abitibi Power & Paper Co. Common.....	130½	132
American Book Co.....	144	148
American Sales Book Co. Common.....	65	66
American Sales Book Co. Pfd.....	104	105
American Tissue Mills Co. Pfd.....	90	92
American Writing Paper Co. Ctfs.....	22⅛	22½
American Writing Paper Co. old Pfd.....	1½	
A. P. W. Pulp & Paper Pfd.....	98½	99¼
A. P. W. Pulp & Paper Common.....	20⅛	21
Androscoggin Pulp Co. Common.....	30	
Androscoggin Pulp Co. Pfd.....	90	
American Writing Paper Co. Pfd. Ctfs.....	50¼	50⅞
Burt Co. Common.....	65½	66
Belgo Canadian Paper Co. Pfd.....	105	
Brompton Pulp & Paper Co. Common.....	58	58½
Beaverboard Co. Pfd.....	38	39½
British Columbia Pulp & Paper Pfd.....	67	72
Brompton Pulp & Paper Co. 8% Pfd.....	101½	
Brown Corp. Pfd.....	104	
Canadian Bag Co.....	180	
Canadian Paperboard Co. Pfd.....	90	
Celotex Pfd.	89	
Celotex Common	63	
Champion Fibre Co. Pfd.....	107½	110
Champion Coated Paper Co.....		125
Champion Coated Paper Pfd.....	111	115
Champion Fibre Co. Common.....	250	
Crown Williamette Paper Co. Common.....		10
Chemical Paper Mfg. Co. 1st Pfd.....	90	
Chillicothe Paper Co. Pfd.....		105
Diem & Wing Pfd.....	92	97
Donnacona Paper Co. Common.....	67	
Donnacona Paper Co. Pfd.....	100	
Downington Paper Co. 1st Pfd.....	101¼	
Dryden Paper Co. Ltd.....		14½
Eastern Mfg. Co. Pfd.....	29¾	30½

1,000,000,000

In 38 years of design and manufacture of water filters and softeners, Hungerford & Terry have installed an aggregate daily capacity of more than one billion gallons.

This experience has enabled them to aid paper and other manufacturers to improve their products and reduce their costs of production by the proper treatment of that important material—water.

Is your water supply properly protected to insure highly efficient mill operation and the highest quality in your product? Hungerford & Terry Engineers will investigate your conditions and report to you fully without obligation.

HUNGERFORD & TERRY
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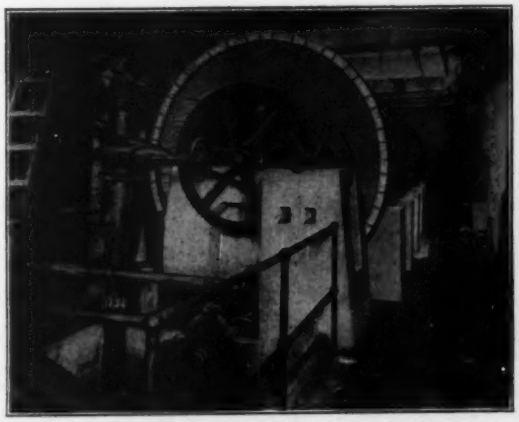
CLAYTON, N. J.



Paper Mill Tanks

The above installation in a well-known Ohio paper mill is only one of Hauser-Stander's successful installations.

Hauser-Stander has been building tanks for over fifty years and has particular knowledge of paper mill men's requirements.

The Hauser-Stander Tank Co.
CINCINNATI, OHIO

Morey Paper Mill Supply Co.

Vulcan TRADE MARK

99 CHAUNCY St. BOSTON, MASS.

Sole Selling Agents

"LAMBETH" COTTON TRANSMISSION ROPE
and EGYPTIAN COTTON ROPE FOR SHEAHAN CARRIERS
Careful, Intelligent, Quick Service

HARDY BRONZE

SCREEN PLATES
ACID RESISTING
VALVES

Wm. A. Hardy & Sons Co.
Fitchburg, Mass.

SCRA M

Centrifuga.

Steam Triplex
Vacuum Pumps Jet Condensers

Manufactured by
The Scranton Pump Co., Scranton, Pa.

PUMPS

UNION SCREEN PLATE CO.

Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

Union Bronze Screen Plates

(Best phosphorised Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

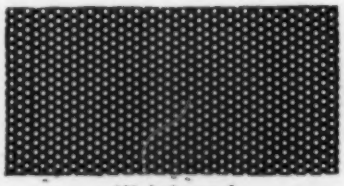
The Witham Screen Plate Fastener, Patented
THE ORIGINAL THE BEST

SCREEN PLATES *and* DANDY ROLLS

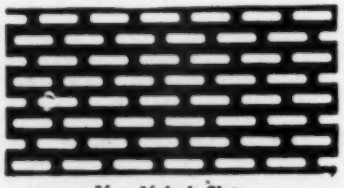
Watermarking
a Specialty

Central Manufacturing Co.
The Quick Service House
KALAMAZOO MICHIGAN

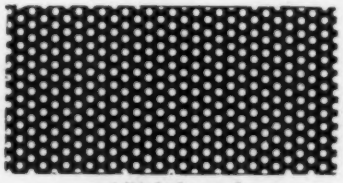
Perforated Metal Screens for Pulp and Paper Mills



.065 inch round



3/4 x 1/4 inch Slots



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Gair (Robt.) Common	12	
Globe Folding Box Pfd.	70	
Great Northern Paper Co.	69½	70
Hammermill Paper Co. Pfd.	106	110
Hinde & Dauch Pfd.	101	
Holyoke Card & Paper Co. Pfd.	170	
International Pulp Co. Pfd.	60	65
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National Paper & Type Pfd.	46	
Oglesby Paper Co. Pfd.	95	
Oxford Paper Co. Pfd.	107	
Oxford Paper Co. Common	165	
Occident Pulp & Paper Co. Pfd.		20
Penobscot Chemical & Fibre Co. Common	75	85
Port Alfred Pulp & Paper Co.	95	98
Provincial Paper Co. Pfd.	99	101
Price Bros	70	72
Package Paper & Supply Units	22	
Price Bros. Pfd.	103	105
Quebec Pulp & Paper Units	78	
Richardson Co. Pfd.	105	
Rubberoid Pfd.	69	71
River Raisin Co. Pfd.	7¾	9
Robertson Paper Co. Pfd.	6	
Spanish River Pulp & Paper Mills Common	131	133
Spanish River Pulp & Paper Pfd.	148	
Scott Paper Co. Pfd.	99	101½
Sefton Mfg. Co.	98	102
Saint Croix Paper Co.	160	
St. Regis Paper Co. Pfd.	101½	103
St. Regis Paper Co. Common	65	67
United Paper Board Pfd.	62	66
United Paper Board Co. Common	20	23
Union Bag & Paper Co.	45½	46
Wayagamack Paper Co.	97	99
Watson (H. F.)	125	
Watervliet Paper Co.	10	
Westfield River Paper Co. Pfd.	OW	BW
Western Paper Good Co. "A"	24	30
West Virginia Pulp & Paper Comm[illegible]	[illegible]	52
Whitaker Paper Co. Pfd.	99½	101
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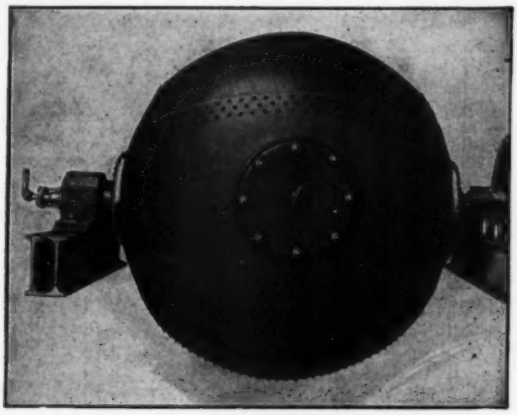

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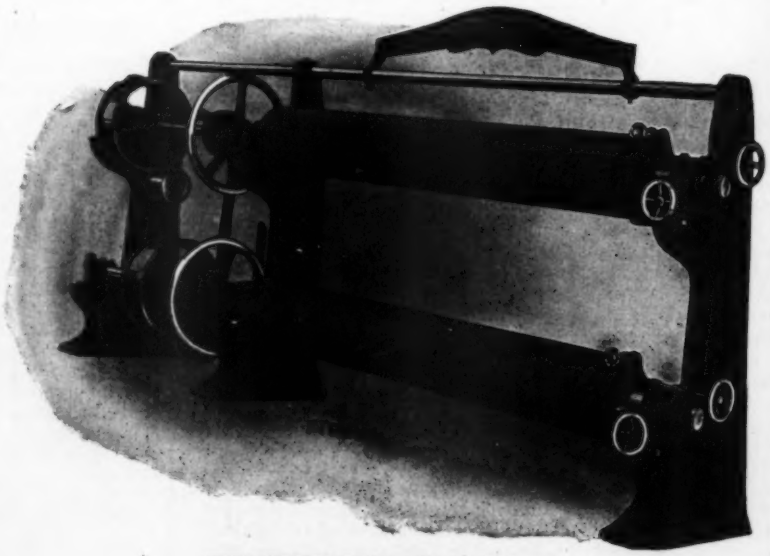

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